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Manufacturing Brass Forgings in Michigan Plant

Experience of Mueller Company During War Period Proves Invaluable in Developing Production of Numerous Forged Brass Articles for Peacetime Consumption

By Edwin Bremer

FORGING generally conveys the impression of working and shaping iron and steel. However, other materials such as aluminum and its alloys, copper and brass now are forged extensively. Most of us remember how in our younger days we watched the blacksmith put iron bars into the forge. If we were fortunate perhaps we were allowed to work the huge leather bellows that forced the fire. When the iron was almost white hot, the smith withdrew it from the forge and amid a shower of sparks, hammered the piece to the desired shape.

Brass forging is not accomplished as easily as this. The temperature must not be too high as the metal might melt or oxidize badly. Also, the brass mixture must be within the forging range or it will crack when subjected to the forging operation. The forging temperature is about 1250 to 1300 degrees Fahr., and the mixtures used contain: Copper 56 to 63 per cent; lead 0.0 to 3 per cent; tin 0.0 to 3 per cent; iron 0.0 to 3 per cent; zinc, remainder. Mixtures containing 87 to 100 per cent copper which include aluminum bronzes and pure copper also are forged. With a copper content below 56 per cent the brass is brittle and those containing from 63 to 86 per cent are hard on dies causing them to crack and also develop hot shortness.

Although some brass forging had been done in Europe before its exploitation in this country during the World war, there seems to be no record when brass forgings first were produced. Several advantages over turning the work from bar stock on automatic machines or other methods are secured by forging. First is a saving of metal; second is the lowering of machine work by proper die design; third a greater density, freedom from porosity and additional strength are imparted to the metal; and fourth a saving in polishing operations in preparing parts for nickel plating.

Demand for small precision parts for munitions during the war did much in developing the process of forging. In 1917, the H. Mueller Mfg. Co., Decatur, Ill., whose corporate name is now Mueller Co., established a plant known as the Mueller Brass Co. in Port Huron, Mich., for the production of forged brass and other munition parts. At the close of the war the firm turned its attention to peacetime pursuits and spent much time and money in adapting and creating a market for brass forgings in industry. Now the firm turns out products valued at $6,000,000 each year. In April, 1927, O. B. Mueller and his son, Bernhardt, liquidated their interests in the original firm and obtained control of the Port Huron plant which was incorporated as a separate company.

The plant is located on a 62-acre plot on the outskirts of Port Huron. Besides the forging department, the plant comprises an electric furnace department for producing billets, a rod and tube mill for the manufacture of rods and seamless tubing, a modern brass foundry, nickel plating department, engineering department for die de-

Market Is Steadily Expanding

CREATING a market for brass forgings was no easy task, but now, after several years of development, these forgings are used for products where strength, smoothness and freedom from porosity are important. The field has gradually expanded and now brass forgings are used for automobile hardware, magneto parts, gasoline and oil line fittings, parts for electrical refrigerators, oil burning equipment, washing machines, plumbing, railroad equipment and hot water and steam-heating appliances. Forgings produced by the Mueller Brass Co. range in weight from 1½ ounces to 15 pounds, but the majority range between 6 and 8 ounces.

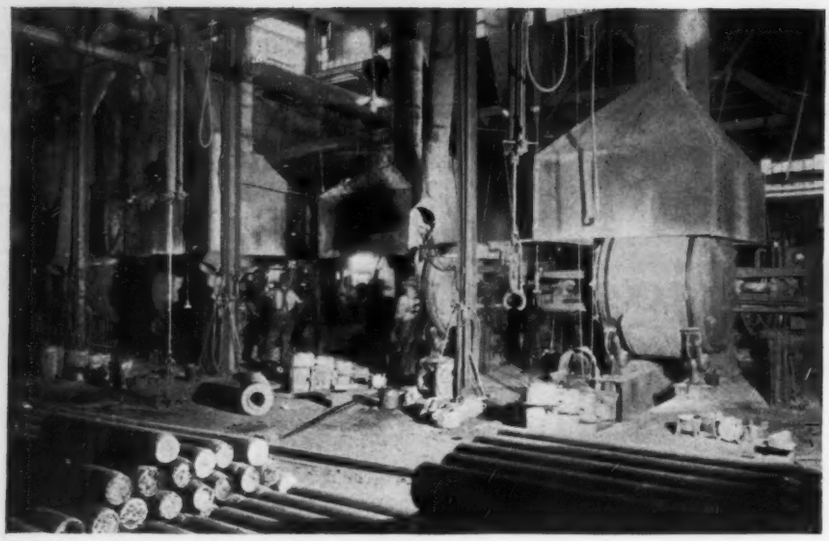

Fig. 1—Billet molds in the pits are filled from the rocking type electric furnace. Fumes evolved during melting are removed through hoods to a bag house a short distance away

sign, a die and tool making department, a metallurgical department, and a machine shop equipped to turn out a variety of machined parts.

Since forgings at the Mueller company are manufactured from blanks sawed from extruded rods, the logical procedure begins with the production of the billets from which the rods are extruded. Fig. 1 shows a view of part of the electric furnace department. Nine furnaces are used in producing billets and six more are available. The furnaces are manufactured by the Detroit Electric Furnace Co., Detroit, and are of the rocking, indirect arc type. They have a rated capacity of 2000 pounds but produce 2475 pounds per heat. The furnaces operate 24 hours a day, and during this period of production 21 heats are poured.

During the melting of brass zinc fumes are evolved due to the low volatilization point of zinc. Consequently above each furnace a large hood is suspended to remove the fumes. The hoods are attached to large diameter pipes which lead to a bag house or dust arrester situated several hundred feet away. An exhaust fan is connected to the ducts leading to the interior of the bags. The fumes are drawn through the bags and in their passage the zinc oxide is deposited on the exterior surface of the bags. Occasionally the bags are shaken to remove the oxide which falls to the bottom of the chamber. From time to time the accumulation of oxide on the bottom of the chamber is removed, put in suitable containers and sold.

The billets may be seen in the foreground of Fig. 1. These are 50 inches long, 7 inches in diameter and weigh 560 pounds. They are poured in cast iron chill molds located in a pit just in front of each furnace. Each billet is marked with a heat number for identification. Two test bars are taken from each heat and sent to the laboratory for chemical and physical examination. After approval by the laboratory, the billets are cropped and sawed in half. They are transported to the mill on a conveyor and are placed in an over-fired, oil reheating furnace designed by the Industrial Heating Equipment Co., Detroit. This furnace which may be seen on the right in Fig. 2, is 24 feet long and 4 feet wide with a sloping bottom down which the billets automatically roll from the charging door at the back to the front.

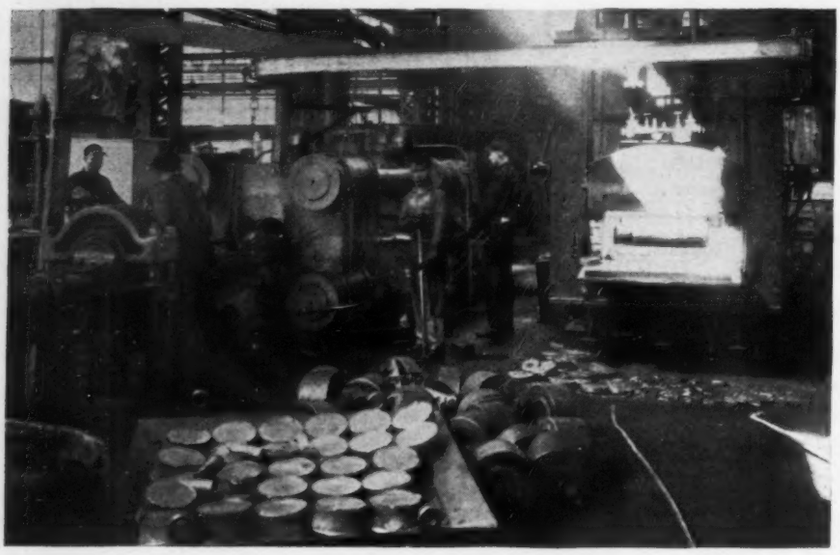

Fig. 2—Heated billets are placed in the press with a 3-pronged fork. After the hoods to a bag house a short distance away

Billets are heated from 1300 to 1350 degrees Fahr., and at this temperature are placed in the extrusion press manufactured by the Southwark Foundry & Machine Co., Philadelphia, which is shown on the left of the illustration. The hot billet is handled with a 3-pronged fork which travels on a monorail. As may be noticed in Fig. 2, a billet is being inserted in the press. After it is in position, the die block which is under the yoke in the left foreground of the machine, is placed hydraulically in position on the large casting forming the front of the press. The ram which operates under 5000 pounds per square inch water pressure then literally squirts the metal through the die into rod. By using dies with various shaped openings, rods of different forms may be extruded.

This rod is taken to the saws for what is known technically as breaking back. This consists in sawing off the end until all indication of pipe and flaws are eliminated. After this operation is performed the rods are inserted in machines which swage the ends to blunt points. Then the rods are drawn through dies to the proper size. Following drawing, the rods are annealed in oil-fired furnaces at 1250 degrees Fahr. from 40 minutes to one and one-half hours depending on the size of the rods and the amount charged into the furnace. After the rods have been annealed properly, they are withdrawn from the furnace, cooled and pickled in sulphuric acid to remove the oxide scale.

Seamless tube manufacture is somewhat similar to the process of extruding rod except that the material is forced over a round-pointed steel plug held in the center of the rolls by a long rod or shaft. This process is known as the Mannesmann

method which increases the length of the tube formed but not its diameter, and is accomplished on a piercing machine built by the Aetna Standard Engineering Co., Ellwood City, Pa. The first operation in seamless tube production is the scalping of the billets to remove dirt and scale. Scalping is done on a machine similar to a lathe. The billets then are placed in an oil-fired, continuous, heat-controlled furnace where they are heated to 1300 to 1350 degrees Fahr. and pierced. Copper requires a higher temperature for plastic deformation and is heated to 1650 degrees. The rough tubes from the piercing machine are from 9 to 11 feet long and about 4 inches diameter. Piercing hardens the tube considerably and it must be annealed before further drawing operations. After annealing the tubes are pickled to remove oxide scale and then are drawn over plugs and through dies to reduce diameter and wall thickness. Each draw reduces the cross sectional area about 30 per cent.

Brass forgings are produced by squeezing a hot blank between two closed or partly closed dies. These dies are operated by presses of varying construction according to the design of the piece being produced. Parts of simple design may be forged under drop hammers while those of intricate design require double-acting presses. Some times where considerable plastic deformation is required, hydraulic presses are advocated.

Design of dies is an important feature of forging, and the Mueller, company maintains an engineering department for this purpose. After the design is completed the drawings are sent to the die sinking department where a corps of expert diemakers create the desired impressions in a block of special die steel. Generally, each die block contains two impressions known as the breaking-down die and the finishing die which are placed side by side. Each impression may produce one or more pieces depending upon the size and design of the article.

Fig. 3 is a close-up view of a die block mounted on drop hammer which shows the upper and lower dies and a blank being forged. This shows the breaking down impression on the left side of the die and the finishing impression on the right. The die shown produces two pieces. The method of operation is as follows: The hammer operator seizes a hot blank from the oil-fired furnace at his left and places it on the die. He then steps on the foot-operated treadle and the hammer falls performing the breaking down operation. As the hammer rises the operator shifts the partly formed forging to the finishing die and the hammer again falls to perform this operation. Just to the left of the die block, the shear is mounted and as the hammer rises, the operator shifts the forging to the shear where the falling hammer separates it from the remainder of the blank. This cycle is repeated until the blank is used up. On this particular forging, the blank supplied enough metal for three forgings or six pieces as each forging contained two pieces.

Fig. 3—Close-up view of die block mounted on a forging hammer.

Brass forging is accomplished on 12 board drop hammers. Some types of forgings require a slower and longer pressure to form them and this is done on 8 crank presses.

Fig. 4 shows one of the newest presses used by the Mueller Brass Co. and its accompanying furnace. The furnace is electrically heated and controlled. Two men operated the press. One man takes the blank from the furnace and places it on the die and the other operates the treadle which puts the press in motion. He also lubricates the die between each forging. All of the furnaces at the forging machines are semi-continuous in operation. A chute is built at the back of the furnace and this is loaded with blanks. As the blanks placed in one half of the furnace are used up, the operator reaches with his tongs to the openings in the back of the furnace connected to the chute and gets a new supply. While these are attaining the proper temperature, the blanks in other half of the furnace are used.

In forging an excess of metal is

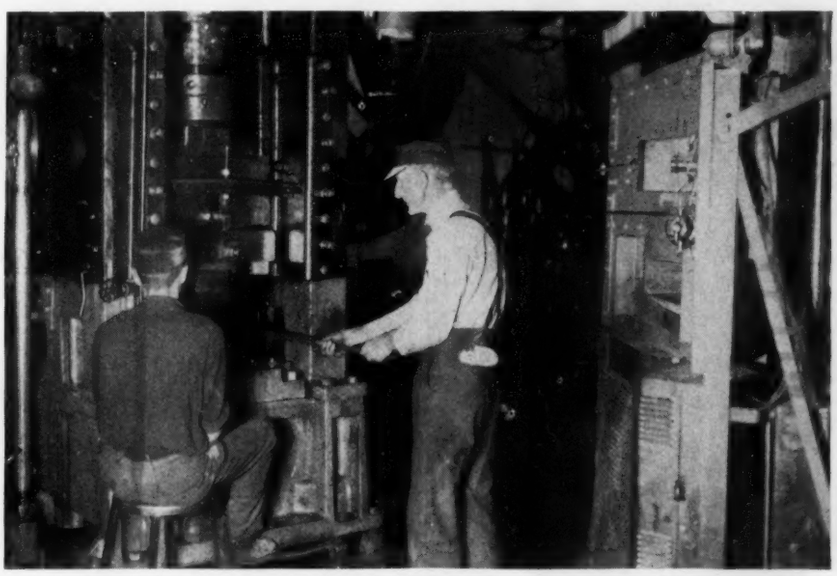

Fig. 4—Heavy crank presses are used where more work is done on the blank. The furnace on the right is electrically heated and automatically controlled

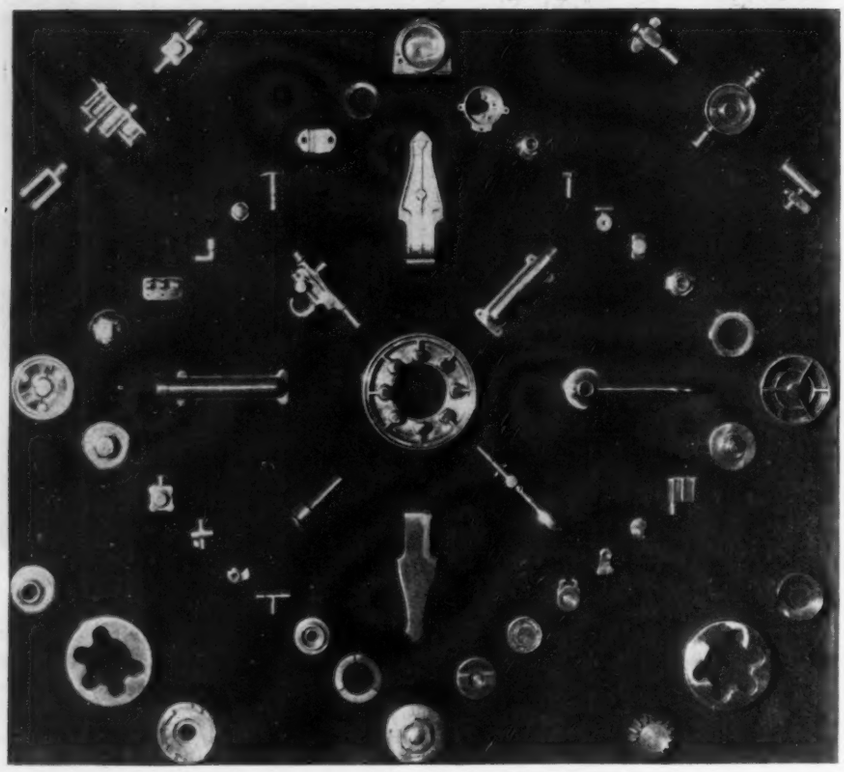

Fig. 5—A collection of forged brass articles showing the different varieties and sizes produced by this method.

necessary that the die be completely filled. The excess metal is squeezed out along the edges of the die and forms a flashing or fin which must be removed. This flashing is removed on a trimming press which contains a die of the proper size and shape. Some of the forgings require little or no machining and other require drilling and tapping operations. This is done either in the machine shop of the Mueller Brass company or in the shops of the purchaser. The surface on the product from the forging operation is smooth and only needs a slight pickling in nitric acid to bring out the color.

A variety of screw machine parts are produced by the firm on 17 automatic chucking, multiple spindle machines. Rods of various shapes, depending on the product turned out, are fed automatically into the machine. Some of the machines take four rods and the chucking head containing the tools for performing the various operations moves forward, engages the rods, makes the cut and slides back. The whole head then rotates until the second tool is in position when it again moves forward to make the cut. This cycle continues until all the tools have performed their operations when the piece automatically is cut off and the rods move forward to make another part. The company also has 58 automatic screw machines which are used to produce small machined articles.

During the operation of cutting on automatic screw machines, an abundance of lubricating medium must flow over the parts being machined. This performs two functions; lubrication and cooling. Since the parts turned out on the machines are covered with oil, a cleaning operation is necessary. This is done on a machine which automatically cleans and dries the parts. Much of the lubricant used adheres to the turnings and chips which are formed during machining. If this is not recovered to some extent, a considerable loss will be involved and beside, extremely oily turnings and chips give rise to dense, acrid fumes when melted. Therefore, the chips and turnings are placed in a centrifugal drier which removes the greater part of the oil.

Many nonferrous castings are supplied with a nickel finish. For this purpose the company maintains a nickel-plating department. To obtain the best appearance of nickel plate or coating, the primary surface which is exterior of the casting, must be prepared carefully. Any defects, blemishes or rough spots will show in the finished product. Therefore, if a smooth and lustrous nickel coat is desired, the primary surface must be the same. Consequently, the cleaned

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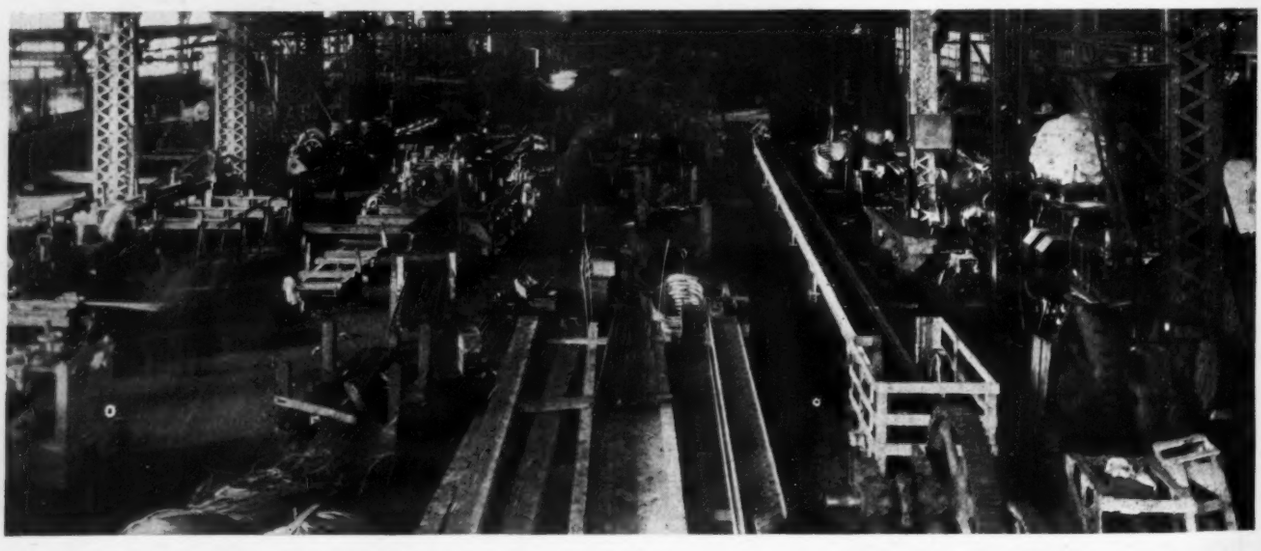


Fig. 6—A view of the mill to which an addition is just being completed. Some of the straightening and cutting benches are shown.

Fabricating Sheet Metal Products by Use of Multiple Welding

Development of Machine for Performing Several Spot Welds in One Operation Speeds Up Production—Large Flat Electrodes Overcome Nonuniformity Resulting from Uneven Wear of Pointed Electrodes

By W. T. Ober

A BROAD definition of electric resistance welding in the uniting of various metal parts which have been raised to a welding temperature by the passage of electric current through that portion or those portions of the parts which are to be united.

Resistance welding is divided into several classes, the three principal ones being: (1) Spot welding, generally thought of in connection with the joining of overlapping sheet metal parts which otherwise would be fastened by rivets or bolts; (2) Butt welding, which is the welding of parts end to end or edge to edge; and (3) Seam welding, which might be termed a continuous spot weld along the overlapping edges of sheet metal parts. It is spot welding, or rather particular forms of spot welding with which this discussion deals.

Since the discovery of resistance welding, practically all spot welds have been made by using a spot welding machine equipped with two so-called pointed copper electrodes or welding dies, the actual size of the point depending upon the thickness of the material to be welded, the capacity of the welding machine used, size of the spot weld required, etc. In this method the pointed electrodes serve as the agent for localizing and concentrating the flow of current to the mass of material directly between the electrodes, and of course, only one spot weld is made for each cycle of operation of the welding machine.

Projection Facilitates Welding

A number of years ago it was discovered that by punching a projection on one of the two parts to be welded this projection would serve as the agent for localizing the current flow, and, therefore, determine the point of weld. Further it was found that the size and shape of this projection determines to a great extent the size or area of the weld, and thus the strength of the weld. Also, by using this projection it was no longer necessary to employ a pointed electrode which, of course, wears away fairly rapidly, but rather that large flat ended electrodes could be used which would last almost indefinitely.

One other advantage of the use of projections was found to be in the welding of scaly material. Scale or rust is, of course, an insulator and it is oftentimes very difficult to force the necessary amount of current for making a weld through the scale when using the ordinary electrode, but by forming a projection on one of the parts, the forming operation breaks up the scale on the projection, and this projection being fairly pointed in turn, breaks through the coating of scale on the other part when pressure is applied through the welding electrodes.

Multiple Welds Investigated

For some years this method of projection welding was employed only in a small way and no attempt was made to weld more than one projection at a time. As the demand for increased production on welded parts grew, experiments were made to determine the possibility of making several spot welds in one operation. At first these experiments were conducted along the lines of using a series of pointed copper electrodes, but only a fair degree of success resulted, as the same old condition of rapid wear of pointed electrodes was encountered, and as the various points of a multiple-pointed electrode did not wear uniformly, a condition was reached after a comparatively short period of operation where due to nonuniform contact between the various points of the multiple electrode and the work, the results were nonuniform welds. Experiments were then conducted relative to the possibility of using large flat electrodes and welding together parts, which, instead of having only one projection, had a number of projections. These experiments immediately proved successful.

Of course it requires a welding machine of larger electrical and mechanical capacity to make several welds in one operation than is required for making single welds. For this reason and also because of the lack of knowledge of how projection welds could be used to advantage on various classes of work, this method of multiple projection welding was not used commercially to any great extent until comparatively recently.

Within the last three or four years the Thomson Electric Welding Co., Lynn, Mass., has designed and developed a number of more or less special welding machines to be used particularly for making multiple projection welds. There also has been developed machines for making multiple welds on parts, the inherent shape or form of which is such that the parts themselves supply their own projections. A typical illustration of this is the welding, in one cycle operation, of a number of wires to one or more wires which cross at right angles, as in wire refrigerator shelves, stove oven racks and articles of a similar nature. Another application of this form of welding is used in the manufacture of grating made from a series of flat rectangular bars stood on edge, to each bar of which is welded in one operation a round or twisted bar laid at right angles to the longitudinal axis of the strips.

Projection Method Widely Used

This method of projection or multiple welding is being used successfully in the automotive field in the manufacture of various automobile body parts, such as door frames, window lifters, four-wheel brake parts, shock absorbers, and on any other article more or less flat or regular in shape and which requires several welds. Experience has taught us that the use of projection welding is not always satisfactory if the part carrying the projection is made

From a paper presented at a meeting of the Affiliated Technical societies, Boston, Dec. 14. The author, W. T. Ober, is assistant sales manager, Thomson Electric Welding Co., Lynn, Mass.

from material thinner than 16 or 18 gage, unless the projections are spaced very close together. This is because a projection punched on thinner material does not have sufficient mass or strength to retain its shape sufficiently long after the welding current and pressure are applied to serve its purpose of localizing the current flow.

There is, of course, also a limit to the number of projection welds which it is practical to make in one operation, this limit being determined principally by the area over which the projections or welds are distributed, for as is readily understood, it is necessary that the welding current distribute itself uniformly between the projections or points at which welding is to occur, and that if the projections are spread over too large an area or surface, difficulties will be encountered in obtaining uniform pressure or contact between the large flat surface of the copper electrodes and the work, resulting in nonuniform distribution of current.

Area Is Limited

In the making of multiple projection welds on sheet metal parts not less than 18 gage in thickness, it has been found that the area over which the projections are distributed should not exceed 30 to 35 square inches, and that the greatest distance between any two projections in the area should not exceed 10 inches. Two to 12 projection welds on sheet metal parts in one operation are now being made as part of the daily production in many factories. Ten to 25, and even 30 welds is one operation are being made on parts of such form that no projection is required, such as soap dishes, oven racks, etc.

The question of whether or not it would be advantageous to use projection or multiple welding on any article now being welded by the single spot method can best be determined by careful investigation of all conditions surrounding the method of manufacture of this article, the production required, the shape and size of the parts and the material from which they are made. The process has a wide field, but is not yet at the point where all of its possibilities or limits are known. Anyone interested in the possibility of applying projection or multiple welding to products now being welded by the single spot method should get in touch with manufacturers of resistance welding equipment, any of whom would be glad to share their knowledge of the process.

Interprets Tests in Furnace Slag

FIFTY plants in the United States are devoted to the crushing and screening of blast furnace slag, and all of them are located east of the Mississippi river. Approximately 2000 people are engaged in the industry of processing and marketing the output of these plants. Their combined output in 1925 was about 8,000,000 tons of commercialized slag; and, it is estimated that fully 65 per cent of this product was consumed in highway construction. The foregoing are a few of the interesting statements included in a dissertation prepared by Clarence E. Bardsley on "Utilization of Blast Furnace Slag in Highway Construction" and published in bulletin form by the School of Mines and Metallurgy, University of Missouri, Rolla, Mo.

Various Details Discussed

The history, manufacture and use of slag as a structural material; tests on blast furnace slag, their interpretations and conclusions; and, general conclusions and recommendations are discussed in separate chapters. Slag has more bonding surface area per unit volume than any other commercial mineral aggregate, on account of the countless bubbles of gas that were entrapped in the molten material when it solidified.

Records show that slag concrete was used in and about blast furnaces in the Birmingham, Ala. district about 40 years ago, first in plant and machinery foundations and later for all kinds of concrete work. One of the earliest reinforced slag concrete buildings was erected in Philadelphia in 1897. Numerous factory and power plant chimneys are constructed of slag concrete, many over 150 feet high, the highest being 273 feet.

Air-cooled blast furnace slag, crushed and screened to a specified size, has been recommended by the highest authorities in highway and pavement construction both in Europe and the United States. It is estimated that slag has been used in over 8000 miles of improved highways in this country. Practically all of the slag concrete roads in the United States are in Ohio, Pennsylvania, Georgia, New York, Indiana, Alabama and W. Virginia. Ohio alone has over 200 miles of slag concrete highways and Pennsylvania 60.

Slag concrete has been used in the construction of over 75 highway and railway bridges in the United States ranging in length from 3187 feet to 18 feet, in width from 72 feet to 18 feet, and in height from 14 to 195 feet; in number of spans or arches from one to 44; and in the tonnage of slag used from a few tons to 30,000 tons in a bridge. These slag concrete bridges carry general traffic, trunk line traffic, trolley and steam railway lines and combination of traffic.

A study of numerous field tests on blast furnace slag leads the author to conclude that though a unit volume of well graded slag has a relatively high percentage of voids, and though the material is capable of absorbing considerable water, no signs of sprawling or disintegration due to excessive stresses are shown. Slag concrete withstands the action of acids better than does crushed stone samples. Slag is much lighter than stone, and has greater bulk to the ton, and so will have smaller freight charges per mile of road than will stone aggregates.

Over 300 references to books, bulletins, engineering papers, foreign and periodical literature, and, proceedings and transactions of engineering societies dealing with blast furnace slag and a chonological bibliography on blast furnace slag have been appended by the author.

Jury Will Award Prizes for Advertising

The jury of the Harvard Advertising Awards to award the prizes for advertising material submitted in 1927 has just been announced by Wallace B. Donham, dean of the Harvard Business school. The awards, comprising annual prizes for outstanding advertisements, advertising campaigns and research in advertising, were founded in 1923 by Edward W. Bok. Included in the awards are five prizes of $2000, four prizes of $1000, and one prize of a gold medal. Advertising material to be eligible for this year's competition must be submitted to the Harvard Business school, Soldiers Field station, Boston, not later than Dec. 31. The jury will convene about the middle of January.

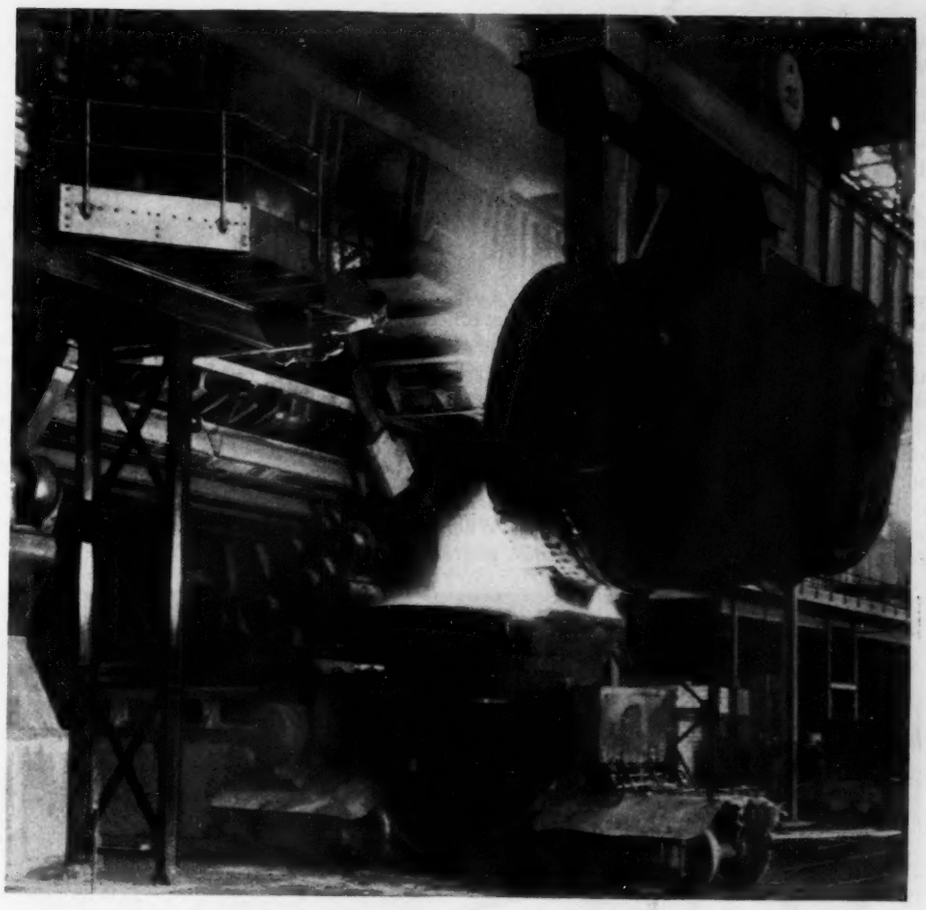
Employs Unique Methods in Making Basic Steel

Raw Materials Stored in Steel Bins—Reservoir Facilitates Pouring Four Ingots Simultaneously

By John D. Knox

NUMEROUS tilting open-hearth furnaces with a capacity of 200 to 250 tons a heat, are operated in the United States but, as far as is known, the only 100-ton furnaces of this type are installed at the Fordson plant of the Ford Motor Co., Fordson, Mich. While the general principles of steelmaking are employed at this plant, yet the layout and equipment, and methods of handling raw material and of pouring the steel differ from those followed by the average open-hearth department in this country.

Upon entering the open-hearth building the casual observer might expect to find rabbles, stirring rods, tapping bars, shovels, and test ladles strewn haphazardly on the charging floor. This, however, is not the case. Everything is in spick-and-span order. On the charging floor in front of each furnace is a shallow pan in which the materials for making the furnace bottom are kept; fluorspar, ferroalloys, magnesite, basic slag and other materials used in steelmaking are stored in small bins built opposite each furnace. The charging floor from one end to another is kept spotless.



Dumping the dregs of the steel ladle after a heat is poured

Cleanliness, however, is only one of the many features associated with the steelworks and rolling mill departments of the Ford company, as will be apparent to the reader later.

The open-hearth department is housed in a steel and brick constructed building 1068 feet long and 234 feet wide. The structure is roofed with concrete tile; the roof, 74 feet from the bottom trusses to the charging floor, is equipped with monitors. The open-hearth structure is built with three bays, one of which houses the stockhouse, another the charging floor and the third the pouring aisle. The stockhouse, 66 feet wide, is served by two 10-ton and one 15-ton cranes.

For many months a large portion of the steel melted in the open hearths has been ship steel salvaged from the 199 merchant vessels purchased from the United States Shipping board. The method employed by the Ford company in cutting up the steel was described in the October 7, 1926 issue of IRON TRADE REVIEW, page 193. Sections of the vessels which are not suitable for passing to the open-hearth furnaces on account of their bulk and irregular shape are conveyed from the River Rouge slip to the pig machine. Here the section is cut by oxygen torches into various pieces weighing 6000 pounds each. A few minutes before the molten metal from the blast furnace is poured into pig form, a 6000-pound section is lowered into the ladle and is remelted. Approximately 600 tons of the bulky ship sections are salvaged in this manner a month.

As the pieces of steel are removed from the ship, they are loaded on

cars and hauled about a quarter mile to the stockhouse of the open-hearth department. Immediately inside the stockhouse is located a 1000-ton steam hydraulic shear capable of handling approximately 300 tons of ship steel in 24 hours. The large sections and ship plates are transferred from the flat cars by magnet and crane to the flat-type tilting conveyor on the approach side of the shear. As the shear makes a cut, stock at the rear of the shear is being flattened or crushed on an anvil. When a cut has been made the conveyor moves the material ahead bringing it to rest with the crushed portion between the cutting head. Meanwhile, each severed portion is conveyed away from the shear and is ejected into charging boxes resting on cars. Smaller size vessel scrap is cut into charging box sizes by two Pell-type and one alligator shear.

A balcony, 21 feet wide and level with the charging floor, is built in the stockhouse. Charging cars, each carrying four charging boxes, are spotted on this balcony. When the boxes receiving the scrap from the 1000-ton shear are filled, four are lifted simultaneously by a crane and placed on their charging truck spotted on the balcony. Scrap from other departments of the Ford company and pig iron also are elevated from the stockhouse floor by magnet and crane and loaded into the charging boxes. Two standard-gage tracks laid on the balcony floor are connected with the charging box track in front of the seven open-hearth furnaces by three cross-overs.

Other materials to make up the charge of the open hearths, such as limestone, fluorspar, ferroalloys, iron ore and dolomite, are unloaded into a skip outside the stockhouse building and are elevated to the roof trusses. Here the materials are dumped upon a conveyor which discharges them into steel bins spanning one of the balcony tracks. Thirteen bins are provided, two of which hold 100 tons of limestone each while the 11 remaining bins hold one carload each. From the bins the material is discharged into the charging boxes spotted beneath the discharge door and after being weighed on floor-type scales, is conveyed over the cross-over tracks to the open-hearth furnaces by an electric locomotive of the storage battery type.

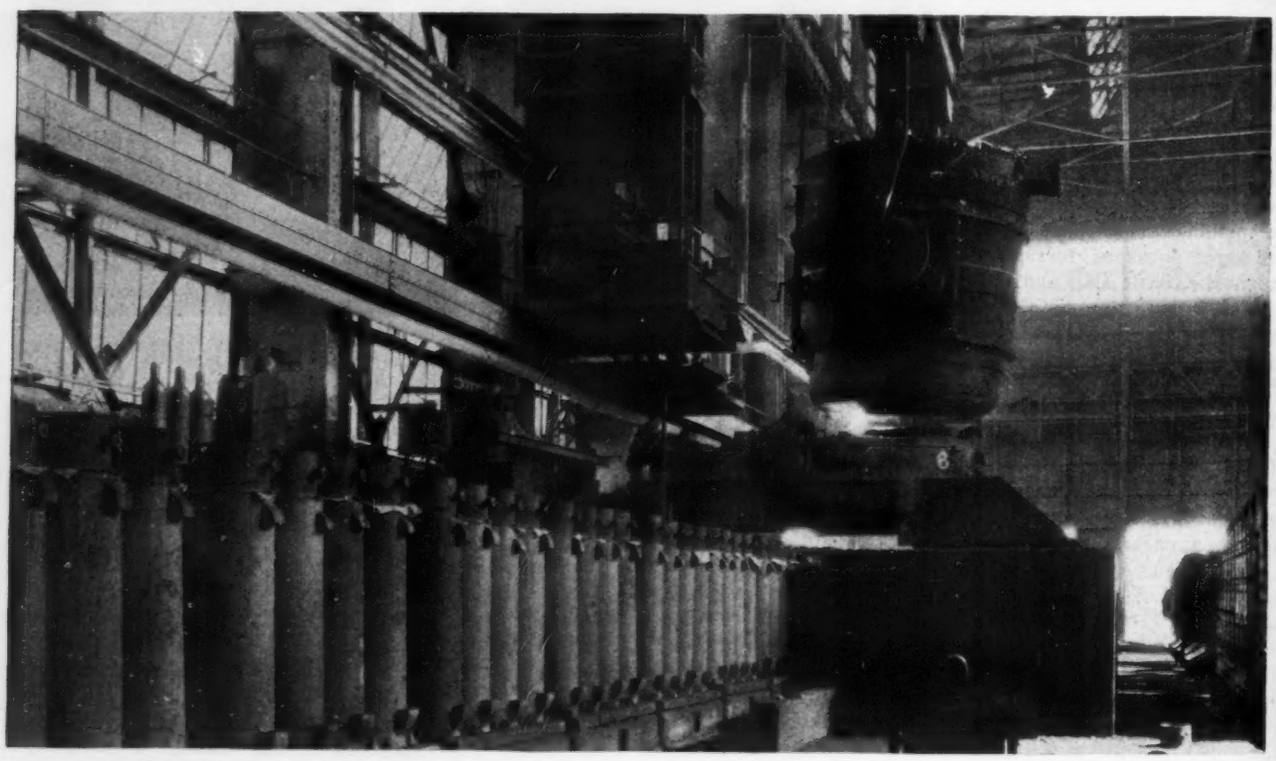
Mixer Is Provided

The charging floor is 72 feet wide and is paved with brick. A 600-ton, cylindrical type hot metal mixer, is located at one end in line with the open-hearth furnaces. Ladles of hot metal from the blast furnaces are shifted into the pouring bay and their contents emptied into the mixer; mixer metal is conveyed to the open-hearth furnaces in a 65-ton ladle. When the desired amount of metal is poured, the ladle is transferred by crane to a truck which operates on a standard-gage track laid lengthwise of the building opposite the furnaces.

Seven 100-ton basic open-hearth furnaces are housed in the steel-making department, four being of the tilting type and three of the stationary type. The tilting furnaces are built with hearths 15 x 37 feet and can be tilted 22½ degrees forward, or 10 degrees backward by a horizontal screw mechanism. The fronts, ports and ends are water-cooled. The walls are reinforced by buckstays made of steel castings. Each furnace is 42 feet 7½ inches long from face to face of chills. Six of the furnaces are built with five charging doors each which are water-cooled and raised or lowered by a chain which operates over a motor-driven drum. The seventh furnace, known as No. 10, is equipped with two wide charging doors to facilitate charging large pieces that cannot be cut with the shears.

Each furnace is fired with tar from the company's coke ovens but burners are provided so that gas and oil can be used as fuel in case conditions warrant. Tar is brought into the plant in tank cars and is discharged into storage tanks built outside the open-hearth building. Waste gases are exhausted into the atmosphere by brick-lined stacks, 175 feet high and 7½ feet in diameter.

Waste heat boilers operate in conjunction with each furnace. These



Pouring platform showing the reservoir employed for pouring four ingots simultaneously. The steel ladle remains in a fixed position during the operation. When a batch of molds on one side of the stool is filled the pouring dish is racked to the opposite side and the nozzles spotted over the four remaining molds on the car

Charging floor at the open-hearth department, Ford Motor Co., Fordson, Mich. Due attention is given to the matter of cleanliness as the view depicts. Rabbles, stirring rods and other tools are kept on racks between furnaces; various steelmaking materials are stored in bins shown at the right near the building columns

are of the vertical single-pass fire-tube type and are rated at 400 horsepower. The boilers are installed in a 30-foot bay located between the stock yard and the charging floor. Products of combustion leaving the checker chamber pass through a tunnel which connects with the stack and by means of dampers are by-passed to the boilers. The gases pass through a superheater in the uptake, down through the vertical boiler and then through a steam turbine driven fan which exhausts them to the stacks. The waste gases enter at 1200 degrees Fahr. and leave at 600 degrees Fahr. Each boiler has 5700 square feet of heating surface and is built for 250 pounds steam pressure at 100 degrees superheat. From 12,000 to 18,000 pounds of steam per hour is generated by each boiler, this being sufficient to operate the shear and to atomize the tar for melting the charge.

Slag is handled in thimbles with a capacity of 250 cubic feet each. These are mounted on trucks which operate on tracks laid beneath each furnace. Slag from the furnace is poured directly into the ladle and when a heat is being tapped the slag flows from the rear spout into the cinder thimble which is spotted back of the steel ladle. After the ladle of steel is moved to the pouring bay the cinder car is moved beneath the pouring spout and receives the slag remaining in the furnace.

Steel is tapped into a 120-ton ladle and is transferred from the furnace to the pouring platform by a 175-ton crane. Two cranes of this capacity serve the pouring floor. At most open-hearth plants in this country the practice is to pour the steel into molds consecutively, each ingot weighing from 2 to 4 tons. The practice of the Ford plant, however, is to pour four ingots simultaneously, each weighing about 1680 pounds. The molds, oval-shape and fluted on the interior, measure 12 inches on the long diameter of the oval, 10 inches on the short diameter and are 60 inches long. Approximately 120 molds are required to handle a heat of steel.

Bottom Provided with Plug

The bottom opening of the molds used by the Ford company employ the 2-plug closure. The upper plug merely is a splash disk made of heavy-gage sheet steel and is adapted to receive the impact of the hot metal during the pouring operation without cutting the bottom walls of the mold. This disk is seated in a recess so that all lateral movement is prevented. The bottom plug, made of cast iron, is slightly conical shaped and fits into a hole in the mold bottom.

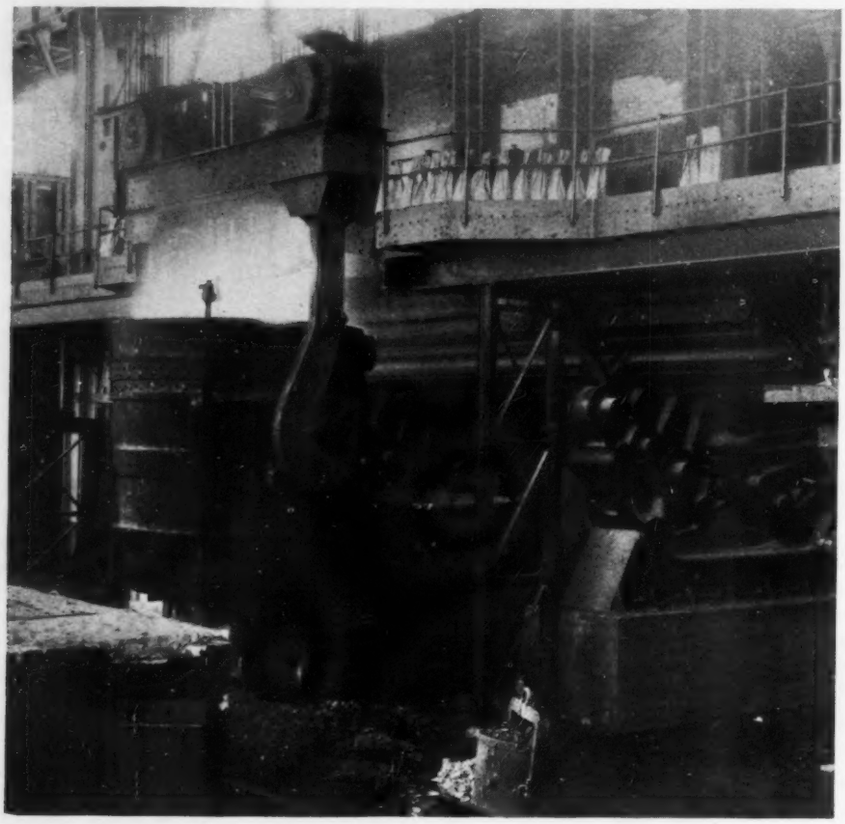
Each ingot stool holds eight molds arranged four in a row. The train of molds passes beneath a pouring dish which is 2 feet deep and is equipped with four nozzles. The reservoir is lined with 6 inches of fire brick and is equipped with a cast-steel cover having a 4-inch refractory lining. The cover is equipped with a rectangular slot 5 feet long and 1 inch wide through which metal from the ladle is poured. During the pouring operation the large ladle remains is a fixed position. The pouring dish may be racked transversely through a distance of 39 inches. When four ingots are poured the reservoir is spotted over the four ingots on the opposite side, the rectangular slot in the reservoir cover permitting the continuous flow of metal from the ladle. When a batch of eight molds are poured, the ingot train is moved forward a car length and the operation is repeated. From 20 to 25 minutes are required to dispose of the heat. By this method of teeming there is no segregation of manganese and the variation in the chemical constituents of the ingot is insignificant. Whatever slag remains in the steel ladle after the heat is poured, is dumped in a slag bucket placed near one end of the pouring floor.

After the steel is poured the mold train is shifted into the stripper building adjacent to the open-hearth department. Here the hot tops, made from waste sand from the foundries

operated by the Ford company, are removed.

When the hot tops are removed, the ingot car is spotted over a stripping device composed of eight rams. These rams are elevated simultaneously and pressed against the cast-iron bottom plug loosening the ingot from its mold. The mold train then is transferred to the soaking pit building nearby where the pit crane charges the ingot into the pit furnaces.

The sand, which remains on the hot tops, is removed by a vibrator and is



Tapping a heat of steel into a 120-ton ladle. The slag overflow is received by a cinder car spotted beneath the furnace

conveyed to a machine where it is mixed with waste sand from the foundry. From the mixer the sand is conveyed to an overhead hopper which serves jar ramming molding machines beneath. When the hot tops are molded they are placed nine on a rack and are conveyed through a continuous gas-fired oven. About two hours are required to adequately dry the tops. The hot tops then are placed on a conveyor and passed from the mold room into the pouring bay where they are mounted on the various ingot molds for addition service. In preparing the mold to receive the heat, eight are lifted simultaneously from the car and are dipped into a graphite mixture. The ingot stools are equipped with dowels which facilitates locating the ingots accurately over the required hole in each stool.

Steel Density Values Are Determined

Accurate values of the density of pure iron and of various carbon steels are given in a scientific paper of the bureau of standards which recently has been issued. Engineers' handbooks and tables give approximate values for density of pure iron and steel as 7.8 to 7.9. The bureau's value for the average density of pure iron is 7.864 grams per cubic centimeter.

Carbon steels, as hot rolled, show a gradual decrease in density with increasing carbon content up to about 1.3 per cent and values lie on or close to the straight line which may be represented by the equation: Density equals 7.855 minus 0.032 C, where C is the percentage carbon.

These values were decided upon as the result of many experiments in which samples of pure iron and steels of different carbon content were subjected to varying heat treatments. Copies of this paper, No. 562, may be obtained from the superintendent of documents, Washington, at 10 cents.

Announce Conditions of Dodge Fellowship

The Taylor society has prepared a folder setting forth the requirements and conditions of tenure for its recently established James Mapes Dodge fellowship in scientific management. The fellowship was established by Mrs. James Mapes Dodge, Philadelphia, in memory of her husband who was the first president of the society.

Graduates of engineering schools, schools of business administration, commerce and finance, and of all schools and departments of university and college rank in which management is an important subject of instruction will be eligible to appointment, dependent upon their qualifications. A fellow who has been appointed for two years will apportion that period with four months of library study, one year of continuous work in a scientific management plant, five months of travel and inspection of other plants and three months of additional library study and writing of a thesis. Complete information can be obtained by addressing H. S. Person, managing director of the Taylor society, 29 West Thirty-ninth street, New York City.

Steel Drum Standard Is Slightly Revised

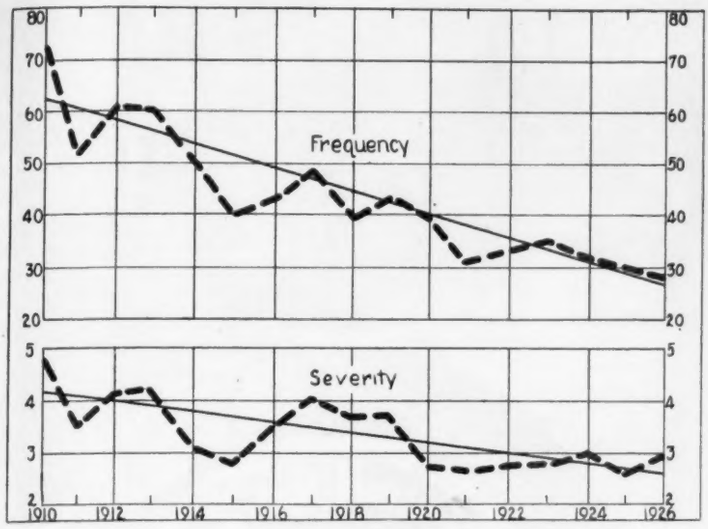
Three changes in simplified practice recommendation No. 20 have been made by the standing committee of the steel barrels and drums industry, following the annual revision conference in Cleveland, Dec. 7, the department of commerce states. These changes are:

1. Standard I. C. C. drum, 33 gallon eliminated and 30 gallon substituted.

2. Friction cover light drum, a 100-pound grease drum should be added to this classification.

3. The note under Table 2 should be changed to read as follows: "Capacity of drum to be not less than 10 gallons nor more than 110 gallons, and gage of steel to be used, to be not less than 20 U. S. standard.

The elimination of the 33 gallon I. C. C. drum is promoted by the fact the survey for 1926 showed 1255, while in the case of the 30 gallon drum more than 9000 was recorded. The increase of the tendency on the part of manufacturers to specialize on this drum resulted in the standing committee's action. The addition of the 100-pound grease drum was necessary because the survey indicated approximately 25,000 of these being used in 1926. The recommendation is to be duly revised in accordance with the action of this committee, effective Jan. 1, 1928.



Frequency and severity accident rates, per 1,000,000 *hours' exposure, in iron and steel industry.*

Steel Industry Brings Down Its Accidents

CONTINUED benefits of accident prevention work in the iron and steel industry are reflected in the annual report issued this week by the bureau of labor statistics. The bureau's statistics show that there has been a constant decline in the frequency rate during the past 20 years, the rate being 69.2 per 1,000,000 hours' exposure for the five-year period 1907-1911, and 29.9 for the period 1922-1926. In a large group of plants selected because they have been most successful in accident prevention the frequency rate in 1926 was 6.8 per 1,000,000 hours, compared with 8.2 in 1925 and 60.3 in 1913.

For some years past accident experience in the iron and steel industry has been presented by the bureau for two groups of plants. One group is selected as embodying the most pronounced success in the effort at accident prevention. The other group embraces all plants for which it is possible to secure information, and includes those plants in the first group.

The results reported for all plants, as shown in an accompanying table, do not compare so favorably with those in the selected group. The accident frequency rate instead of dropping from 60.3 to 6.8, as for the selected group, declined only from 59.6 to 25.3 in the same period.

While the severity rate increased slightly in 1926, for the iron and steel industry as a whole, the trend continues downward. The decline in severity is more irregular than in frequency because of the intrusion from time to time of death and permanent disabilities with their heavier weighting. Statistics grouped in five year periods show that for the combined departments of the industry frequency declines with perfect regularity from period to period, while severity shows a number of instances of irregularity. Commenting on this, the report states:

"The single exception to the regular decline is found in the foundries. There is some slight variation, but it is quite as likely to be in one direction as the other, and the trend, if there is one, is upward, rather than downward."

The accident frequency rate in foundries in 1913 was 72.8, while in 1926 is was 60.6. The accident severity rate in foundries in 1913 was 3.7, and in 1926, 3.3.

"Attention has been called to this situation from time to time in these annual reviews," the bureau states, "and it is distinctly disappointing that, taken as a whole, foundries are so much out of step with the other departments of the industry."

Alters Heating Furnaces

A tube welding furnace at the plant of the Tyler Tube & Pipe Co., Washington, Pa. recently was converted to a double-gutter lapweld pipe furnace capable of handling stock from 2 to 8 inches diameter.

How Iron and Steel Industry Has Reduced Accidents

ACCIDENTS AND ACCIDENT RATES—1907 TO 1926, BY DEPARTMENTS AND BY YEARS AND 5-YEAR PERIODS

Year or period	Full-year workers	Number of Cases				Accident frequency rates (per 1,000,000 hours' exposure)				Accident severity rates (per 1,000,000 hours' exposure)			
		Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total	Death	Permanent disability	Temporary disability	Total
1907	27,632	61	106	6,530	6,697	0.7	1.3	78.8	80.8	4.4	1.7	1.1	7.2
1910	202,157	327	848	44,108	45,283	0.5	1.4	72.7	74.7	3.2	1.2	0.8	5.2
1911	231,544	204	931	34,676	35,811	0.3	1.3	49.9	51.5	1.8	1.1	0.6	3.5
1912	300,992	348	1,241	54,575	56,164	0.4	1.4	60.4	62.2	2.3	1.1	0.8	4.2
1913	319,919	426	1,200	55,556	57,182	0.4	1.3	57.9	59.6	2.7	0.9	0.7	4.3
1914	256,299	219	860	37,390	38,469	0.3	1.1	48.6	50.0	1.7	0.9	0.6	3.2
1915	116,224	87	372	13,481	13,940	0.2	1.1	38.7	40.0	1.5	0.7	0.5	2.7
1916	166,646	159	728	20,655	21,542	0.3	1.4	41.3	43.0	1.9	1.0	0.6	3.5
1917	410,852	523	1,268	57,094	58,885	0.4	1.0	46.3	47.7	2.5	0.9	0.6	4.0
1918	474,435	543	1,253	54,293	56,089	0.4	0.9	38.1	39.4	2.3	0.8	0.5	3.6
1919	377,549	419	848	41,009	42,276	0.4	1.0	40.2	41.6	2.2	0.8	0.6	3.6
1920	442,685	327	1,084	49,482	50,893	0.2	0.8	37.3	38.3	1.5	0.8	0.4	2.7
1921	237,094	156	527	21,279	21,962	0.2	0.7	29.9	30.8	1.3	0.7	0.5	2.5
1922	335,909	236	878	32,120	33,234	0.2	0.9	31.9	33.0	1.4	0.8	0.5	2.7
1923	434,693	314	1,188	41,766	43,268	0.2	0.9	32.1	33.2	1.4	0.8	0.5	2.7
1924	389,438	312	1,133	34,481	35,920	0.3	1.0	29.5	30.8	1.6	0.9	0.5	3.0
1925	445,223	207	1,091	36,404	37,772	0.2	0.8	27.3	28.3	1.2	0.8	0.4	2.5
1926	436,692	322	1,202	31,667	33,230	0.2	0.9	24.2	25.3	1.7	0.8	0.4	2.9
1910-1914	1,310,911	1,524	5,080	226,305	232,954	0.4	1.3	57.5	59.2	2.3	1.1	0.7	4.1
1915-1919	1,545,706	1,731	4,469	186,532	192,732	0.4	1.0	40.2	41.6	2.2	0.8	0.6	3.6
1920-1924	1,839,818	1,345	4,810	179,128	185,277	0.2	0.9	32.5	33.6	1.5	0.8	0.5	2.8

Large Uses of Steel in Small Ways

Tire Chains

SNOW and sleet and wintry weather, however, disagreeable to some people, is welcomed with smiles by manufacturers of tire chains. The demand for these chains fluctuates by nearly 100 per cent, depending upon the weather. One open winter, reasonably free from snow and ice, has meant actual failure to several new companies starting up in the tire chain manufacturing business.

Many substitutes for the common type of non-skid chain have been introduced but nearly all have fallen by the wayside and the cross link steel chain design seems to be the most efficient means of preventing an automobile from skidding on snow and ice. The demand for tire chains, in spite of the fluctuating weather, has gradually increased since 1920, and the total tonnage of wire used in their manufacture also has increased.

Many factors enter into this question of tonnage. Automobile wheels are getting smaller in diameter and this means fewer cross links and shorter side chains. However, to partially offset this, the popularity of the balloon tires has increased the length of the average cross link. Although more than a dozen manufacturers in this country make non-skid chains, nearly 90 per cent of the total production is confined to five companies. These five have a combined output of about 10,500 tons of tire chains a year.

Tire chains nearly all are made of low carbon steel wire. The wire for the cross links is held below 0.08 carbon and is of a special analysis and grade. It is a bright finished wire manufactured by the large steel companies as tire chain wire. It is made of basic steel. It must be uniform and must have good welding properties. It ranges in size from No. 7, 0.177 inches in diameter, to No. 5, 0.207 inches in diameter. The side, chains, which do not get road wear, are ordinary low carbon steel, usually 0.15 carbon. These side links usually are turned out rapidly and in long lengths on chain forming machines of a fairly simple design. The chains for making the cross links, however, are of a far different nature.

The larger companies have elaborate automatic welding and forming machines which take the wire from the coil, form it into links, electrically weld these links and automatically turn out complete sections of the desired length. These cross links are tested carefully and then are subjected to case hardening. This particular process is the bugbear of the tire chain industry and it has taken years of experimental work to develop it to its present point of efficiency. The case hardening must not go too deep or the links will be brittle and will break under the severe strains in usage. On the other hand, the case hardening must be deep enough to prevent rapid wear when driving on concrete. Some companies now claim to have chain which will last 200 miles on a concrete road. It is not uncommon, however, to find that a chain will wear out in 50 or 60 miles.

From this it may be seen that there

THIS is the one-hundredth sixth of a series of articles dealing with some of the obscure uses of steel which go far toward absorbing the American tonnage.

Among articles appearing every two weeks and not included in Vol. I containing 51 separate descriptions are:

Vacuum Bottles
Highway Guards
Numbering Machines
Joist Hangers
Straight Razors
Piano Wire
Type Molds
Swords
Suspenders
Screw Hooks
Steel Bridging
Mail Boxes
Steel Shelving
Automobile Bumpers
Automobile Bumpers

still is room for improvement and the larger companies are operating elaborate research laboratories in an attempt to increase the life of cross links. One company has developed an automatic testing machine based on varying magnetic properties of steel. The chain in a long length is slowly passed through a magnetic field. An instrument indicates the variation in magnetic structure and, when predetermined limits are exceeded, this trips a switch calling attention to the defective link or links.

Tire chain fasteners usually are made from sheet stampings. One manufacturer, however, uses a malleable casting for one portion and a pressed steel form for the other. Of the automobiles operating in this country, about 2,000,000 require at least one set of chains a year. The average set of chains weigh about 12 pounds which means 12,000 tons for the total. This figure fairly accurately checks the total based on reports of manufacturers. In addition to the actual chains, much other steel enters into the tire chain industry. One manufacturer estimates that 100,000 chain cutters have been sold to garages for the sole purpose of cutting case hardened links. Other chain tools and chain accessories bring the total tonnage of steel used for non-skid purposes on automobiles up to 15,000 tons a year or more. This is exclusive of truck chains which are usually of a different design and difficult to segregate from the general chain classification.

The side chains and fasteners are subjected to a rust proofing process. This is usually sherardizing or a similar process, and in some plants has been developed to a high point of automatic operation. The illustration shows one part of the rust proofing division in a large tire chain manufacturing plant.

Constructs Power House

In the new power and boiler house now under construction at the Campbell works of the Youngstown Sheet & Tube Co., Campbell, O. are being installed six 2000 horsepower gas-fired boilers with auxiliary equipment to permit the use of powdered coal when circumstances warrant; an 18,000-kilowatt turbo generator; three 60,000 cubic foot turbo blowers; and, a 9375 kilovolt-ampere frequency changer.

Metal Door & Trim Co., Laporte, Ind., will complete and equip its $250,000 factory addition within the next two months.

Adopts New Marking for Forged Wrenches

In the past it has been customary to stamp the heads of drop-forged wrenches having fixed openings with the bolt or cap screw size which each opening would accommodate. The new American standard bolts and nuts recently adopted would add still other markings to the listing already carried by the wrench, consequently the American Engineering Standards committee has specified that wrenches shall be marked with the width across flats of the nut they are designed to fit. This recommendation has been adopted by the principal manufacturers of drop-forged wrenches and all wrenches, except those on hand, hereafter will be marked with the size of the opening only.

To avoid unnecessary confusion and to educate both mechanics and distributors to the new practice, the J. H. Williams & Co., Buffalo, has prepared a table of standard bolt, nut and cap screw sizes served by each opening size. This table is as follows:

*Openings as stamped	U. S. STANDARD		S.A.E. Std.	AMERICAN STD.	
	For U. S. Std. Nuts; Size Bolts	For U. S. Hex Head Cap Screws; Diameter Screws	For S.A.E. Std. Nuts and Cap Screws; Size Bolts	For Amer. Std. Nuts; Size Bolts	For Amer. Std. Hex. Head Cap Screw Dia. Screws
5/16	1/8	1/8			
3/8	3/16	3/16			
13/32					
7/16	1/4	1/4	1/4	1/4	1/4
1/2		5/16	5/16		5/16
9/16	5/16	3/8	3/8	5/16	3/8
19/32					
5/8	3/8	7/16	7/16	3/8	7/16
11/16					
3/4	7/16	1/2	1/2	7/16	1/2
25/32					
13/16	1/2	9/16	9/16	1/2	9/16
7/8		5/8		9/16	5/8
15/16	9/16			5/8	
31/32					
1		3/4	11/16		3/4
1- 1/16	5/8		3/4		
1- 1/8		7/8		3/4	7/8
1- 1/4	3/4	1	7/8		
1- 5/16				7/8	1
1- 3/8		1-1/8	1		
1- 7/16	7/8			1	1-1/8
1- 1/2		1-1/4	1-1/8	1-1/8	1-1/4
1- 5/8	1	1-3/8	1-1/4	1-1/4	
1-11/16					
1-13/16	1-1/8		1-3/8		
1- 7/8			1-1/2	1-1/2	
2	1-1/4				
2- 3/16	1-3/8			1-3/4	
2- 1/4					
2- 3/8	1-1/2			2	
2- 9/16	1-5/8				
2- 5/8				2-1/4	
2- 3/4	1-3/4				
2-15/16	1-7/8			2-1/2	
3					
3- 1/8	2			2-3/4	
3- 3/8					
3- 1/2	2-1/4			3	
3- 3/4					
4- 7/8	2-1/2				
4- 1/8					
4- 1/4	2-3/4				
4- 1/2					
4- 5/8	3				
5	3-1/4				
5- 3/8	3-1/2				
5- 3/4	3-3/4				
6- 1/8	4				
6- 7/8	4-1/2				
7- 5/8	5				

*Proper clearance is provided by the manufacturer.

Copies of the leaflet showing this table may be secured by communicating with the J. H. Williams Co.

Continues To Make Most Textile Machinery

The center of the textile machinery manufacturing industry is eastern Massachusetts. A survey recently made by the Worcester Bank & Trust Co., Worcester, Mass., of leading interests in the district reveals the fact that orders are starting to improve after the summer lull. The Whitin Machine Works, Whitinsville, Mass., one of the largest manufacturers of preparatory machinery, finds operations somewhat greater than they were a year ago. This company, however, does not anticipate any marked increase in business for two or three years. The Draper Corp., Hopedale, Mass., the largest producer of cotton looms, finds new demand for machinery confined almost entirely to the South. It is operating its shops with 2800 men on full time.

Lake Iron Ore Grades Run Fairly Uniform

Preliminary figures pertaining to the grades of iron ore shipped from the Lake Superior district by vessel in 1927, as issued by the Lake Superior Iron Ore association, show the amount of nonbessemer ore was 67.7 per cent. The proportion of nonbessemer ore was 24.4 per cent, manganiferous 4.6 per cent, silicious 2.2 per cent, and aluminous 0.9 per cent.

The proportionate shares of the various grades followed rather closely those of 1926. In that year bessemer ore shipments by vessel amounted to 27.1 per cent of the total, nonbessemer 66.6 per cent, manganiferous 3.8 per cent, silicious 1.9 per cent, and aluminous 0.8 per cent.

These comparisons show a loss of 2.7 per cent for bessemer, a loss of 1.1 per cent for nonbessemer, a gain of 1.6 per cent for manganiferous, a gain of 0.3 per cent for silicious, and a gain of 0.1 per cent for aluminous ore.

The tonnages of the various grades shipped in 1926 by vessel were: Bessemer, 12,346,501 tons; nonbessemer, 34,301,378 tons; manganiferous, 2,365,177 tons; silicious, 1,119,985 tons, and aluminous, 463,006 tons. These are bill of lading weights, approximately 1 per cent less than the actual tonnage.

The total of lake shipments in 1927 was about 12 per cent less than in 1926. However, shipments of manganiferous ore were 116,677 tons above 1926, and those of silicious ore 10,770 tons above 1926.

Larger Stoves Installed

Seven new stoves, 26 feet diameter and 115 feet high, for heating the blast recently were completed at the Carrie furnaces of the Carnegie Steel Co. at Rankin, Pa. Complete new hot and cold blast mains, gas mains and two Feld-type gas washers also were installed. The work was executed by the Riter-Conley Co., Pittsburgh.

Encyclopedia of Sheet Steel Shows Complexity of Uses

A MARKED contribution to the existing information on the sheet steel industry, from a merchandising and marketing angle, was made recently by the Sheet Steel Trade Extension committee in issuance of "5000 Sheet Steel Products and Who Make Them." This book, reviewed briefly in IRON TRADE REVIEW, Oct. 27, has 445 pages crowded with listings, and directories.

The book opens with a preface which informs the reader that the book was designed to answer the frequent question of consumers, "Where can we buy it?" A six page article on "What Is Sheet Steel," by Frank A. Weidman, with numerous illustrations precedes the statistical data. A page of United States standard weights and gages for iron and steel sheets as established by congress March, 3, 1893 and a page on the simplified practice recommendation No. 28 of the department of commerce also are presented.

Sheet Producers Listed

The first directory in the book is the list of sheet steel manufacturers of the United States and Canada. Ohio was shown to be the center of the sheet steel industry, being headquarters for 16 of the 41 companies listed. Pennsylvania had the next largest number with 10, West Virginia was third with three, and California and Illinois each had two. Canada was listed with one sheet steel company, and the following states also with one each; Indiana, Maryland, Michigan, Kentucky, New York, Missouri, and Alabama.

Three main listings then followed tabulating the names of fabricators, one list alphabetically, another alphabetically by states and the third alphabetically by products. An index of all sheet steel products with an index of the fabricators who make them concludes the book.

In the alphabetical listing of fabricators, 3032 names are tabulated. The companies represent all phases from sheet steel jobbers to automobile builders, with all types of steel products manufactured included. This directory may well be classified as containing names of the most representative metalworking companies in the United States and Canada.

Ohio is the home of the metalworking industries according to the directory which shows in the geographical listing a total of 404 companies located in that state. New York runs a close second with 392. That the Middle West dominates in the number of plants manufacturing iron and steel products is demonstrated in the distribution of companies. Of those states having 100 or more plants, only Massachusetts and New York are found east of the Alleghenies, and Pennsylvania on the border. Following are the states leading in number of metalworking plants contained: Ohio, 404; New York, 392; Illinois, 387; Pennsylvania, 311; Michigan, 188; Missouri, 168; Indiana, 139; Massachusetts, 122, and Wisconsin, 107.

That Missouri should show a greater total than Massachusetts may be as surprising as the fact that Utah has twice as many listed as Delaware. A total of 85 companies are listed with headquarters in Canada. The smallest representations are presented by Hawaii and Nevada with one company each, New Mexico and South Carolina with two each, and South Dakota and Delaware with three each. Vermont and the District of Columbia each have five metalworking companies listed, and Arkansas and Florida each have six. Utah has seven companies named in the directory.

The section on 5000 sheet steel products occupies 343 pages of the book, interspersed with advertising of sheet steel makers. This directory lists the makers of everything from "absorbers, shock for autos," to "wringers, mop." Under the heading of automobiles, 51 companies are listed. Barrelmaking also is well represented with 29 manufacturers. In addition to the general barrel classification, 38 subdivisions of all types from alcohol to welded were presented. Forty-six makers of grain bins are listed, in addition to 24 other types.

Includes Steel Garagemakers

The invasion of sheet steel into portable buildings is shown in the popularity of the allsteel garage field in which 86 manufacturers are competing, according to the directory. In the building classification 104 different types are listed.

Oil burners are manufactured by 63 different companies listed. A total of 104 different types of cabinets are listed and 92 kinds of cans are presented, of which latter garbage cans are the most popular, 40 manufacturers being named as making that product. Metal ceilings are produced by 59 companies; some other products with the number of companies making them follow: coal chutes 44; cornices, 64; doors, 96; furnace pipe fittings, 24; furnaces, 244; tank heaters, 22; metal lath, 27; partitions, 31; conductor pipe, 51; furnace pipe, 29; stove pipe, 38; refrigerators, 29; roofing, flat, corrugated and roll, 95; shingles, 42; skylights, 97; stacks, 35; smoke stacks, 71; stoves, 46; tanks, 142; door trim, 32; eaves troughs, 74; ventilators and ventilating systems, 144; windows, 36. Many of these classifications are identified with the building industry on which a large number of manufacturers concentrate their production.

Research Work Costing $200,000,000 Yearly

About $200,000,000 annually is being spent in the United States for industrial research by industrial corporations and by the federal government, with industry spending $2 for every $1 spent by the government, according to the National Industrial Conference board, New York.

In 1921 only 578 companies were known to maintain research departments or laboratories, but more than 1000 concerns have research divisions in operation at present. In addition, 70 trade associations are spending about $15,000,000 a year in research, and 152 colleges and technical schools about $1,500,000. Furthermore, much technical research work is being carried on in connection with industrial production, the costs of which are not segregated as such but are accounted for as part of production costs and hence are not included in the total sum here given.

Industries whose research expenditures were largest five years ago are those which have scored the greatest relative growth since then. The greatest amount spent by any one single manufacturing company among those from which the board has detailed statements in 1926 was more

than $5,250,000, while a public utility corporation spent approximately $13,000,000 within the year. Manufacturing companies were found to spend on an average from one to three per cent of the gross amount received from sales on research.

Patent Practice Survey Is Published

An inquiry has been made by the Merchants' Association of New York, through its industrial bureau, of 23 representative manufacturing companies in 10 fields as to the practice with regard to patentable ideas or inventions made by employes. It appears from the replies received that 10 companies have a definite plan for rewarding employes for inventions and 12 have none. The practice is exceedingly variable. Some companies have adopted contract forms to be signed by the employer and his employes regarding inventions and discoveries. Others pay cash in accordance with the value of the discovery. A limited number of copies of the report are available and may be obtained upon application to the Merchants' association.

Honor Tunnel Engineers

On behalf of the four national engineering societies, the American Society of Mechanical Engineers, American Institute of Mining and Metallurgical Engineers, American Society of Civil Engineers and American Institute of Electrical Engineers, Col. Willard T. Chevalier, at a commemorative session at the administrative offices of the Holland vehicular tunnel, connecting New York and New Jersey under the Hudson river, recently presented memorial parchments honoring the three engineers whose genius made possible the building of this great new artery of traffic. Ole Singstad was the only one on hand to acknowledge the honor, the other two, Clifford M. Holland and Milton H. Freeman, having died while the construction work was in progress. The parchments were designed by Charles Rollinson.

Packs Refractory Brick with Heavy Paper

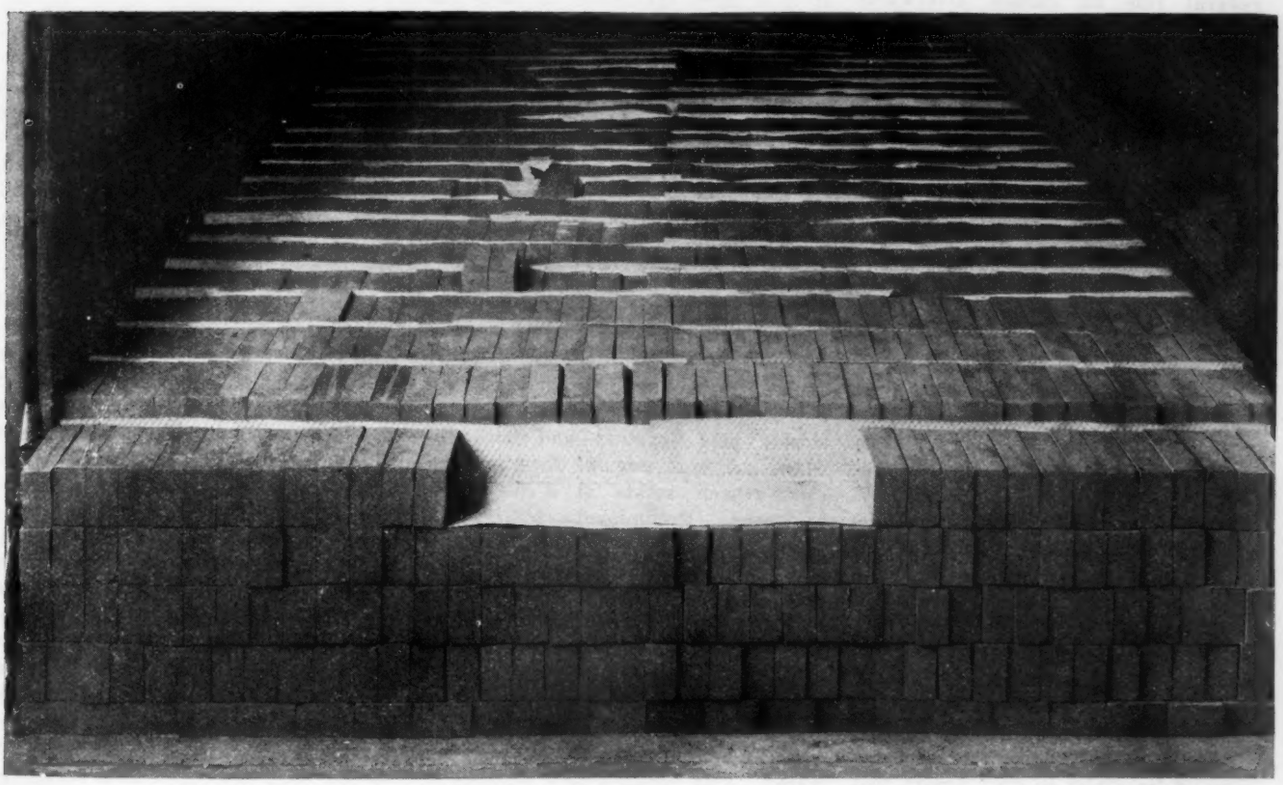
To prevent damage of refractory brick in transit, E. J. Lavino & Co., Philadelphia, has adopted the method of inserting layers of heavy indented paper between the various rows of brick while being packed in box cars for shipment. Heretofore, the company employed straw and other materials to prevent damage to the brick during shipment but despite the care employed in packing, breakage frequently occurred because of inadequate protection. Exhaustive tests have demonstrated to the company that paper packing reduces breakage to the minimum, permits the cars of brick upon arriving at the point of destination to be unloaded quickly and eliminates considerable refuse at both the loading and receiving end.

Studies Steel Densities

Density values for commercially pure and electrolytic iron and a series of carbon steels are given in scientific paper No. 562 of the bureau of standards, Washington which recently has been issued. The density values apply on the steels when hot rolled, annealed, quenched and when quenched and tempered. The pamphlet discusses previous studies of density, experimental work and results and includes a selected bibliography dealing with the subject.

Boosts Fireproof Steel

Advantages of structural steel for the erection of fireproof buildings have been set forth in a booklet just issued by the American Institute of Steel Construction titled "Fireproofing Specification." The data include a time temperature curve showing the density and duration of fires, a description of fire hazards and an explanation of the performance of steel under varying temperatures. Diagrams and data of several tests also are included in the booklet.



CONSIGNMENT OF REFRACTORY BRICK PACKED WITH INDENTED PAPER BETWEEN THE ROWS TO PREVENT DAMAGE IN TRANSIT

The Court Rules:

A series of decisions in actual civil and criminal cases which are typical of those frequently encountered by small shops in metalworking industries.

By M. L. Hayward

Auditor's Statement Not Binding on Directors

I AM enclosing herewith your account to date, and if you find same correct I would be glad to receive your check by return mail," the Bestyet Metal Co. writes.

"Your account received, the items of which are correct, and as I am short of funds just at present will send you check inside of one month from today," the customer replies.

The foregoing correspondence constitutes what the lawyers call an "account stated." It is an admission by the customer to show that he owes the amount of the account, which as a general rule he cannot afterwards deny.

In a recent case decided by the Kansas supreme court and reported in 185 Pacific Reporter, 893, a new phase of this question was presented.

It appeared by the evidence that Jones had been working for a certain metal corporation and claimed that there was $750 due him as a balance on salary, which the corporation was unable or unwilling to pay, and Jones sued in the Kansas courts.

"We do not owe you that amount," the corporation contended.

"Yes, you do, and more than that, you've admitted it," Jones declared.

"You haven't a scratch to show that we owe you a cent," the corporation persisted.

"That's true enough," Jones admitted, "but you employed an auditor, his financial standing was read to the board of directors, and they approved it."

"But that don't bind us to pay you $750 any more than if we'd read the almanac," the corporation rejoined.

Then Jones played his trump card.

"Yes, it does, because in the statement of liabilities in that report that you approved of you will find, 'Jones, balance of salary $750.' If that isn't an admission I don't know what is," Jones averred.

This was a novel point and the decision of the Kansas supreme court was that merely reading and approving of a financial report of a corporation's liabilities is not an admission by the directors of the correctness of the report, and does not shut them out from afterwards disputing their liability on certain items set out in the report.

"The report of an officer to his association is not an 'account stated.' It is a mere tabulation of facts for the information of the corporation. The approval of such a report does not estop the corporation to deny its accuracy," said the court.

Making Brass Forgings

(*Concluded from Page* 1600)

and inspected forgings and machined parts are brought to the nickeling department where they are buffed, washed and nickeled.

The first operation is buffing which consists in holding the articles against a wheel composed of layers of cloth, closely held together and with the edges cut to a circular form. These cloth wheels rotate at a high rate of speed. Preliminary buffing is aided by the use of tripoli compound which is held against the wheel from time to time. Tripoli is a fine siliceous material which exerts an abrasive action on the metal. When the metal attains the proper smoothness and polish under the action of the tripoli coated wheel, the object is given a final buffing on a plain cloth wheel. This removes any remains of the tripoli and produces a highly finished lustre so necessary to fine plating finishes.

All traces of grease must be removed if the nickel is to adhere firmly to the base. Peeling and defects in the nickel coat may result from the merest trace of grease such as might be left from perspiring hands. Strong alkaline cleaners are used for this purpose and to prevent further handling, the buffed articles are hung on racks containing many hooks. These racks are immersed in the cleaner which is maintained almost at the boiling point. After the articles are cleaned the racks and contents are removed from the bath, allowed to drain for a few minutes and then plunged in a bath of hot water which removes the alkali. The racks then are allowed to drain and are hung in the nickel plating bath until a coat of the proper thickness is deposited. A continuous plating bath is used. This machine has an endless chain to which the racks are attached and move slowly through the bath. Chain speed may be varied to meet conditions and with higher speeds the current density may be increased with resulting increase in plating speed. The voltage employed runs from 4 to 5 volts.

When a coat of the proper thickness has been deposited the articles on the racks are removed from the bath and allowed to drain. They then are placed in a hot water bath to remove all traces of the plating solution. After washing, the racks are suspended to drain and the heat retained by the articles assists in drying them. If a highly lustrous finish is desired, the articles again are buffed. However, if the finish obtained in plating is bright enough, the objects are tumbled in sawdust to remove any vestiges of moisture, inspected and forwarded to the shipping room.

Physical properties of a forged free cutting mixture containing: Copper, 58 to 60 per cent; lead, 1.5 to 2.5 per cent; zinc, 37.5 to 40.5 per cent are given as follows: Tensile strength, 55,000 to 65,000 pounds per square inch; yield point, 28,000 to 35,000 pounds per square inch; elongation in 2 inches, 25 to 40 per cent; brinell hardness (10 millimeter ball), 80. The physical properties of a forged aluminum bronze containing from 86 to 90 per cent copper; 1 to 2 per cent iron, and the remainder aluminum, are stated to be: Tensile strength, 104,000 pounds per square inch; yield point, 75,000 pounds per square inch; elongation in 2 inches, 15 per cent, and brinell hardness (10 millimeter ball), 190.

Editorials

Sheetmakers Find Group Action Pays — ***"Say It With Steel", for Holidays***
Wilson Idea of Industry Prevails — ***Veterans Pass, but New Line Grows***
Users Benefit as Cast Pipe Costs Recede

Approves Trade Extension

RECENT approval by the members contributing to the Sheet Steel Trade Extension committee of a continuance of that body's work on an increased scale for the year ending July, 1929, is an unqualified approval of trade extension work. Realizing the complexity of problems in competition facing each sheet steel producer, these companies have found that most satisfactory development of new markets, most effective educational work and greatest opportunity for successfully launching of new products lay in group action.

Although, as is the case in every co-operative effort, a few members fail to participate in the group plan fully, a sufficiently close unity has been developed to carry on national expansion of sheet steel use. Successfully to promulgate educational programs on a widespread scale requires an expenditure which few individual companies would be willing to undertake. Through the group, this campaign is carried out at a minimum of expense to the individual organization and with benefits to the entire industry.

To offset the inroads which co-operative associations fostering use of other materials are making on the iron and steel industry, manufacturers of other steel products besides sheets might well follow the example of that group and of the American Institute of Steel Construction in aggressively developing its markets.

Acceptance of Steel Gaining

IF YOUR Christmas shopping necessitated a trip to a department store, as it probably did, you saw an amazing display of metal toys. If your interest led you to even a cursory examination of these toys, you discovered that many of the most attractively painted playthings were made of steel.

As a matter of fact, steel played a more important role during the holiday season of 1927 than in that of any previous year. Merchants capitalized the magic word to help sell their products. Toy shops advertised dump trucks, steam shovels, derricks and other mechanical toys as of "all *steel* construction." A middle western manufacturer, who has built up a substantial business on the basis of steel toys, stresses the material in his advertising: "Made from heavy *steel*, braced, trussed and spot welded. You can not break these sturdy playthings, they will not come apart."

But the glorification of steel in Christmas gifts was not confined to toys. Chairs, benches, card tables, ferneries, lamp stands, ash tray holders, kitchen furnishings, radiator covers, and dozens of other household articles of steel were displayed for the discerning eyes of the holiday shoppers. Invariably the steel construction of these articles was emphasized in selling.

In point of tonnage consumed, the use of this material in the articles thus far mentioned is relatively unimportant, but the fact that the word "steel" is potent as a sales argument is truly significant. Does it not reflect the growing tendency toward the acceptance by the public of steel for uses which heretofore were denied this metal? If we are correct in this assumption, the first step has been made in preparing the American public for the utilization of steel on a scale hitherto believed impossible.

Small Shops Still Predominate

THE small manufacturing establishment, with about 50 wage earners on its payroll, continues the backbone of American industry. In New York, with 33,393 individual plants, the average personnel is only 32. Illinois, with 14,117 plants, averages 44. New Jersey follows with 52, Pennsylvania 58, Massachusetts 59, Ohio 61, Connecticut 79 and Michigan 92.

This analysis by the National Industrial Conference board may well prove invaluable in formulating merchandising and personnel programs. Too often the objective is visualized as a plant employing 5000 to 10,000 persons. A

welfare plan will obviously hit the bull's eye more readily if intended for a force of 50 persons rather than a plant like the Illinois Steel Co. works at Gary, Ind. A sales approach to a machine shop with 60 employes blankets more individual prospects than one contrived for the Buick Motor Co. at Flint, Mich.

The small manufacturing establishment, or shop as it is termed by those closest to it, survives despite the formation of large industrial units. It is noteworthy that one of the chief concerns of the late President Wilson on taking office in 1913 was the creation of some federal agency to dull the increasing sharpness of competition, in order to permit the small shop to exist. The benefits of mass production did not entirely neutralize, in the Wilson mind, the benefits to the nation in fostering 50 small shops, with 50 proprietors in close relationship with their employes. The President's ideas eventually took shape in the federal trade commission, although the enabling act went far astray from the original idea.

One Less Link with the Past

WITH the passing of "Uncle Joe" Butler there is one less link between the past generation of iron and steel masters and the present. Of the many men of the industry who died in the past year Judge E. H. Gary and Powell Stackhouse were most closely identified with the basic problems of production. Not all of the stalwarts who were active in the upbuilding of the industry have gone, but the survivors are "getting along" all too swiftly.

As these veterans pass they appear to leave gaps that cannot be filled. In a strict sense that is true. But each man fills his own niche in his particular manner and there are giants in the making today as there were yesterday. It will require another generation of steel executives to ascertain which stand out above the forest and properly appraise their worth.

Foreign Pipe Competition Eases

COMPETITION of foreign cast iron water pipe in the domestic market within the past year was less pronounced than in several preceding years. French pipe entered the Detroit market on two public municipal offerings, but only one large lot was purchased. One award in which French pipe sellers figured was readvertised, the tonnage finally being let to a domestic producer. While foreign pipe had some influence on domestic prices in such territories as Detroit and Milwaukee, overseas competition was not a depressing factor in the generally weak cast iron pipe market during the past year.

Price variations of the past year are ascribed either to the reduction in production costs made possible by new methods or the lower costs of the southern pipe foundries which reflected the decline in southern pig iron prices. Some complaints have come from the Pacific coast concerning breakage of foreign pipe in transit. Whether the foreign pipe give satisfactory service in the ground is, of course, undetermined at this time. Sentiment in the cast iron market as the year ends is at its highest point of the year, and greater stability seems in store.

What Our Readers Are Thinking

Charting Imports and Exports of Capital

NEVER before in the history of international finance has the weight of capital migrations from one continent to another become so tremendous as to break down the normal controls. Belgium has been forced to place an embargo on the entry of foreign capital, in the interests of financial stability. Germany for more than a year has had a supervisory board which regulates the inward flow of foreign capital and sees that it enters productive channels, when admitted.

It is well known, in fact, that the majority of European ministers of finance are closely watching what effect upon the international balance of payments of their respective countries is being produced by incoming foreign capital, and they are prepared to erect emergency barriers, as in the case of Belgium and Germany, the moment danger appears. A strange situation for finance ministers who a few years ago were equally intent upon erecting barricades against the dangers of capital exports!

Throughout the world statistical control of the import and export of securities is becoming comparable in accuracy to foreign trade statistics. The capital-exporting countries, United States, Great Britain, Holland, Switzerland and Sweden, all have published the foreign issues publicly offered in their respective markets. Of the capital borrowing countries, Germany prepares the most elaborate tables, far better than anything found elsewhere. But also in Italy, Jugoslavia, Hungary and Austria may be found monthly compiliations of this important item, which has played so indispensable a part in the reorganization of the coal, iron and steel industries of Germany, Austria and Hungary, as well as in railway reconstruction of every description in many countries of Europe.

Governments are awakening to the significance of this great inflow of wealth into their borders, and half a dozen of them are making elaborate surveys of the extent and distribution of foreign capital in their countries. Another and more difficult task is that of following closely the ebb and flow of short-term credits, banking deposits and speculative accounts of foreign origin, whose sudden withdrawal might have semidisastrous effects upon momentary stability.—WALTER MAITLAND, in *Foreign Trade, published by the American Chamber of Commerce in France.*

IRON TRADE REVIEW

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E. L. SHANER, Editor. *J. D. PEASE, Advertising Director.* *F. F. LIGHT, Circulation Manager.*

Ford Co. Uses 100-Ton Tilting Furnaces in Making Steel. Page 1603.

COMPLETE and compact statistical information, in the form of easily read tables and charts, is one of the features that makes IRON TRADE REVIEW'S Yearbook of Industry a valuable reference work for readers throughout the coming year. Many pages are devoted to data on production and consumption, operations and distribution, markets and prices, over a period of years. The major articles and illustrations in the Yearbook also deal in comprehensive way with economic, merchandising and engineering problems of industry.

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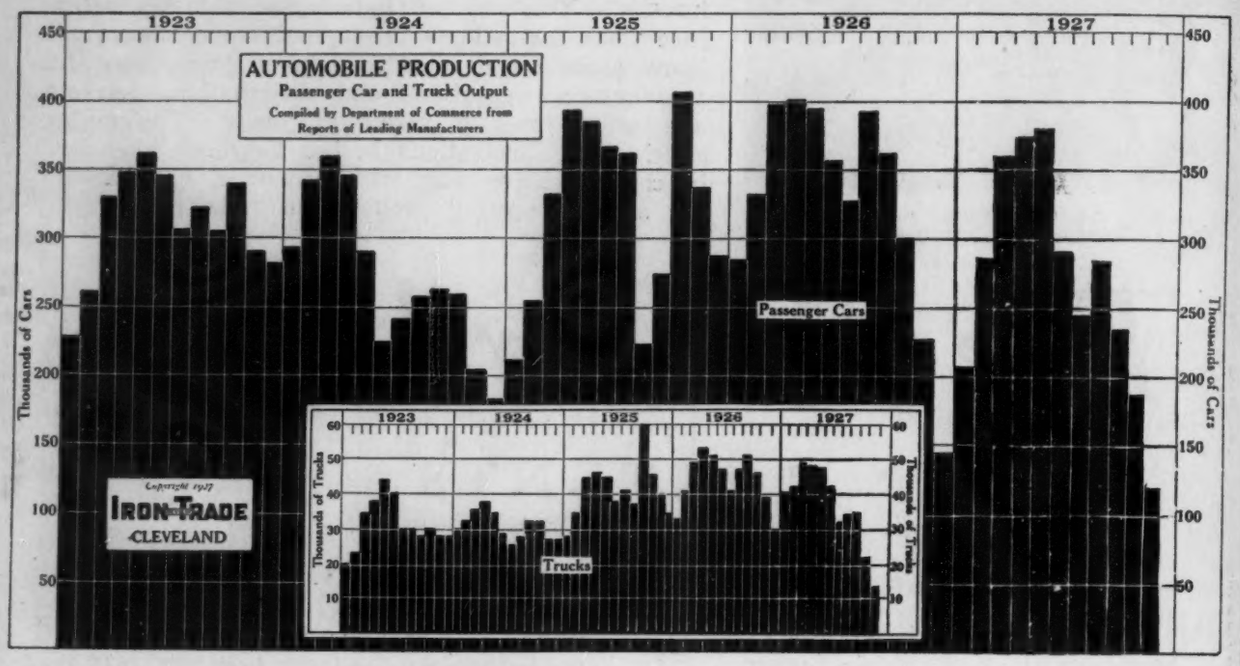
The Business Trend



Automobile Production Drops

By JOHN W. HILL, Financial Editor

THE production of automobiles in the United States and Canada in 1927 will approximate 3,500,000 passenger cars and trucks. This compares with the output of 4,424,000 cars and trucks in 1926. The decline in output was only a little short of 1,000,000 cars and trucks, or about 21 per cent.

SUCH a drastic falling off, of course, was due chiefly to the drop in Ford output over a period extending from spring to the last few weeks of the year. But for companies, other than Ford, there was also some small loss in production compared with one year ago. This decline was caused largely by the general blanket of uncertainty and hesitation flung over the motor car trade by the great Ford "mystery."

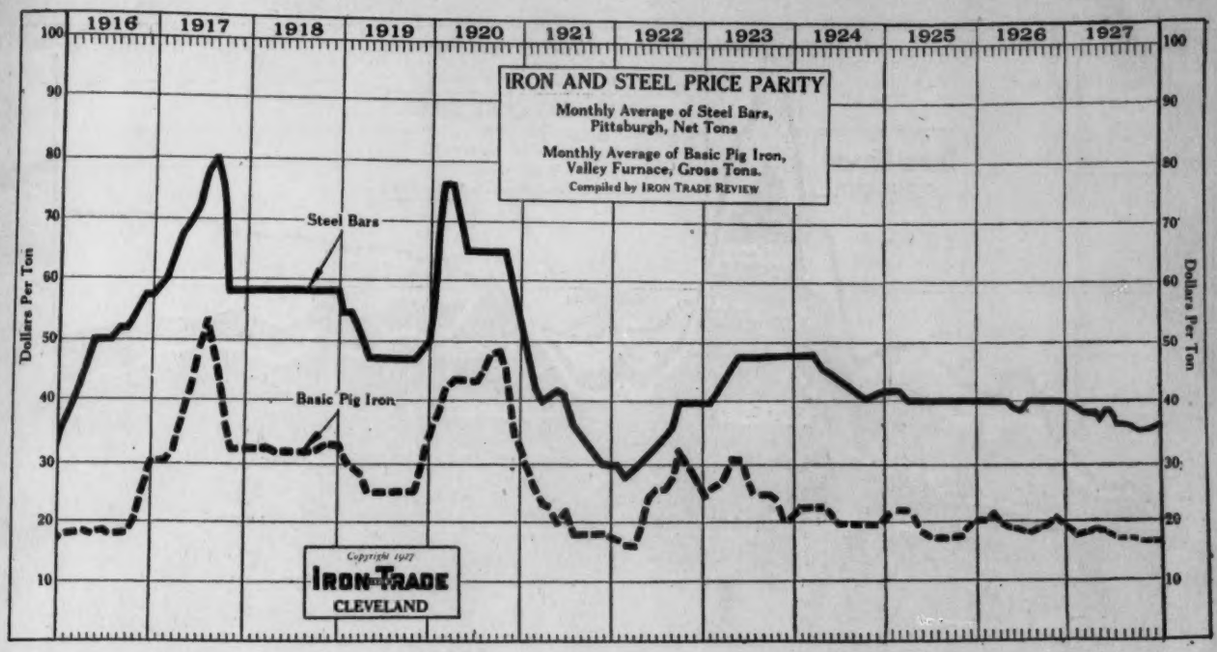
SOME observers, indeed, attribute most of the year's slackening in general industry to the retardation of the motor car trade. Insofar as this was true, the prospect for 1928 is brightened. Conditions in the automobile industry are now more promising. The Ford "mystery" is out in the open, there is a pent up demand for cars and the January motor shows will soon be at hand.

AS SHOWN by the accompanying chart the production of automobiles dropped sharply in November. The total output for the month was about 140,000 cars and trucks. This was the smallest total for any month since February, 1925. Probably this marked the low point of the recession. Certainly there is every reason to expect a strong upward swing in producing activities.

EVIDENCE that no such deep cut in automobile factory payrolls as one year ago is in store this month is indicated by the record of employment in the Detroit district. In the week end December 20 the number of people employed was 202,000. This was a gain of 4209 in a week and of 86,000 over the total for the corresponding week of 1926.

LAST year at this time the motor car industry was confronted by a large excess output. Drastic corrective measures were taken, with the result that plant operations were cut to the bone. This year there has been underproduction rather than the opposite. Buying demand should be further whetted by the appearance of many new models promised for the coming motor shows.

The Business Trend

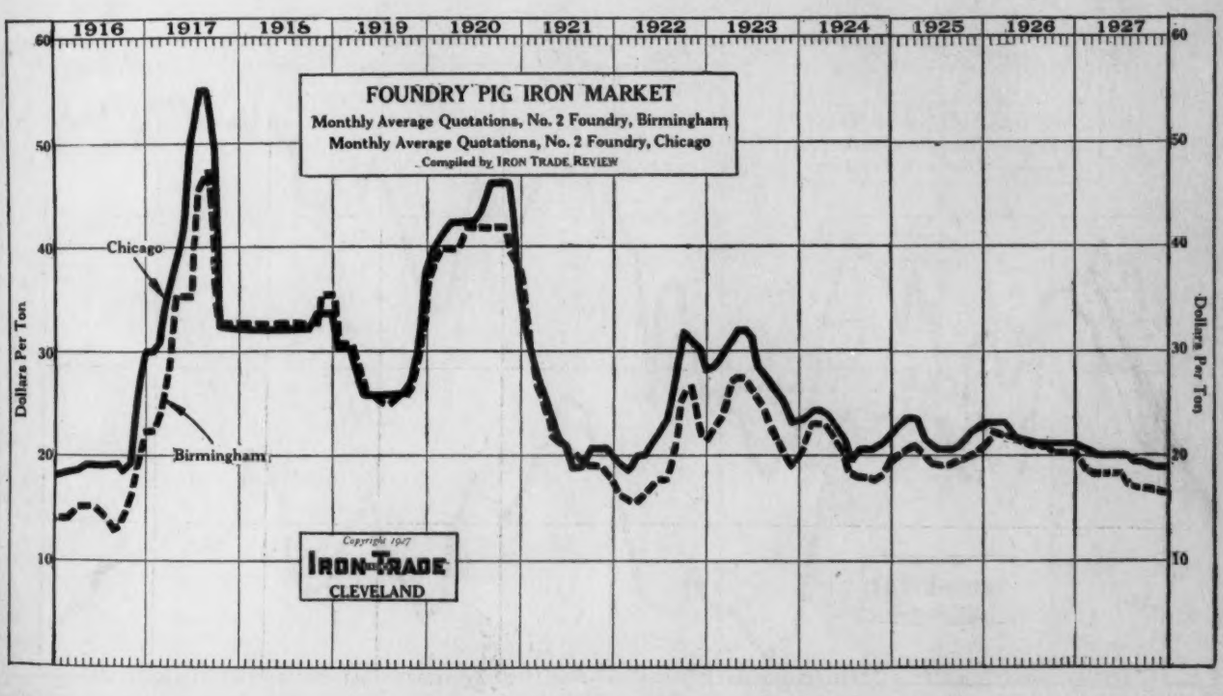


Steel Price Parity

AT THE close of the year the spread between finished steel prices, as represented by steel bar and pig iron prices, was less than it was one year ago. In December, 1926, steel bars at Pittsburgh were quoted at $40 a ton. This compared with $18.80 a ton for basic valley pig iron. One year later the steel bar quotation is $36 a ton while that of basic valley pig iron is $17 a ton. The spread one year ago was $21.20 and in December, 1927, it is $19 a ton.

Foundry Pig Iron Market

WITH Southern foundry pig iron quoted at $16 a ton, the spread between prices of North and South was increased. Chicago No. 2 in December was quoted at $18.50 a ton. This made a spread of $2.50 a ton, compared with a spread of $2.00 a ton in the preceding month. In December, 1926, Northern iron was quoted at $21.00 a ton against $20.00 a ton for Southern iron, a spread of $1.00 a ton. Prices for pig iron have been the weakest link in the chain of quotations of the iron and steel industry.



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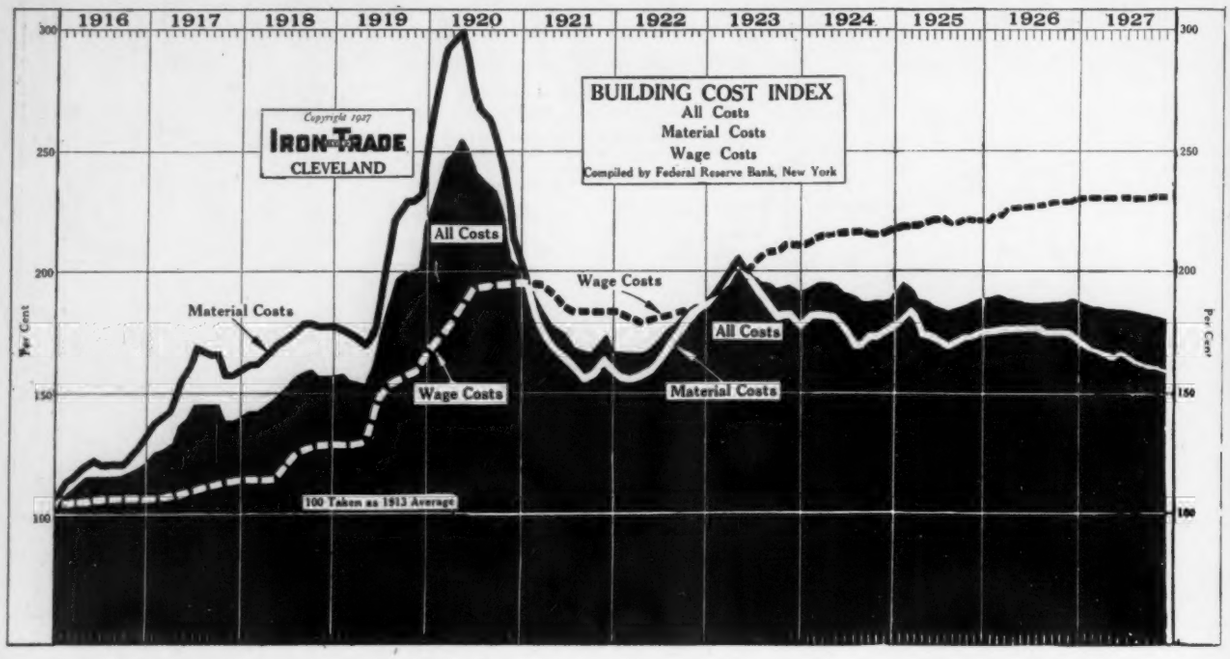
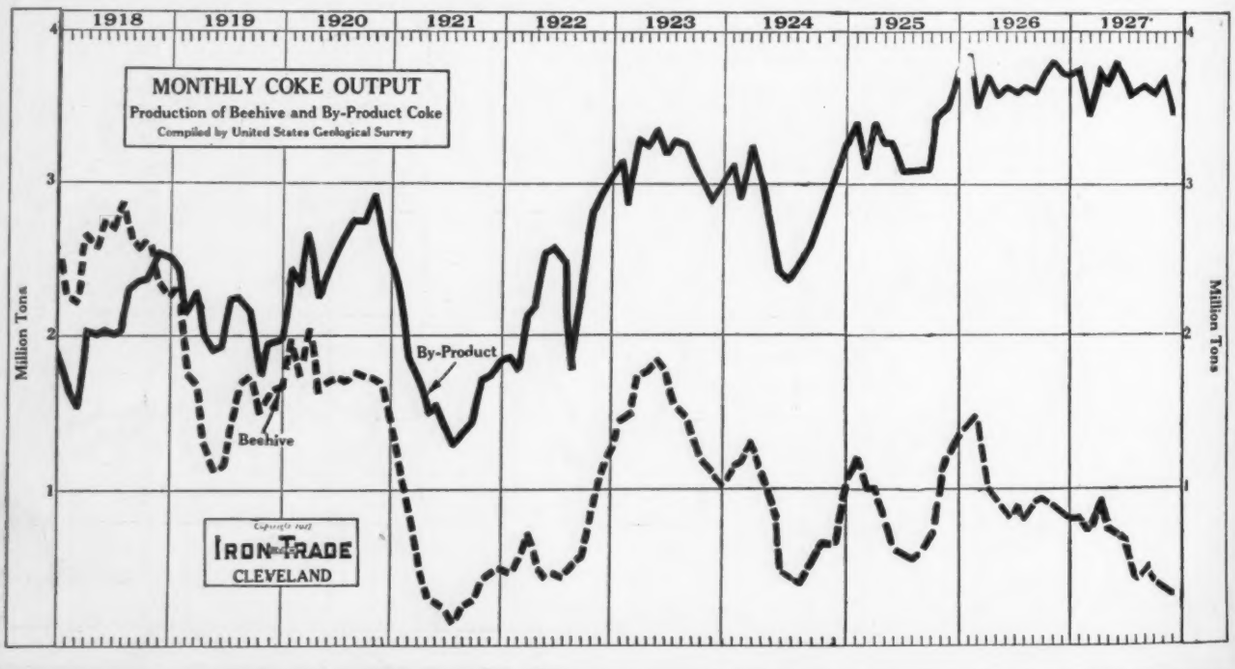


Building Cost Index

COSTS of building construction in the United States, as computed by the Federal Reserve Bank of New York, have declined 10 points in the past 12 months. The index now stands at 186 per cent of the 1913 level compared with 196 per cent of 1913, one year ago. The decline has been occasioned by lower material costs. They now stand 17 points lower than one year ago at an index of 157 against 174 in November, 1926. Wages continue to rise standing at 230 against 228 one year before.

Coke Production

PRODUCTION of by-product coke in November declined 5.5 per cent from the total in October. Beehive coke output was 9.5 per cent lower than that of the preceding month. The total by-product output was 3,500,000 tons against 3,713,000 tons in the preceding month. Production for the first 11 months was 40,249,000 tons or 1.1 per cent less than 1926. Beehive output in November totaled 379 000 tons or 40,000 tons less than the output for the preceding month.



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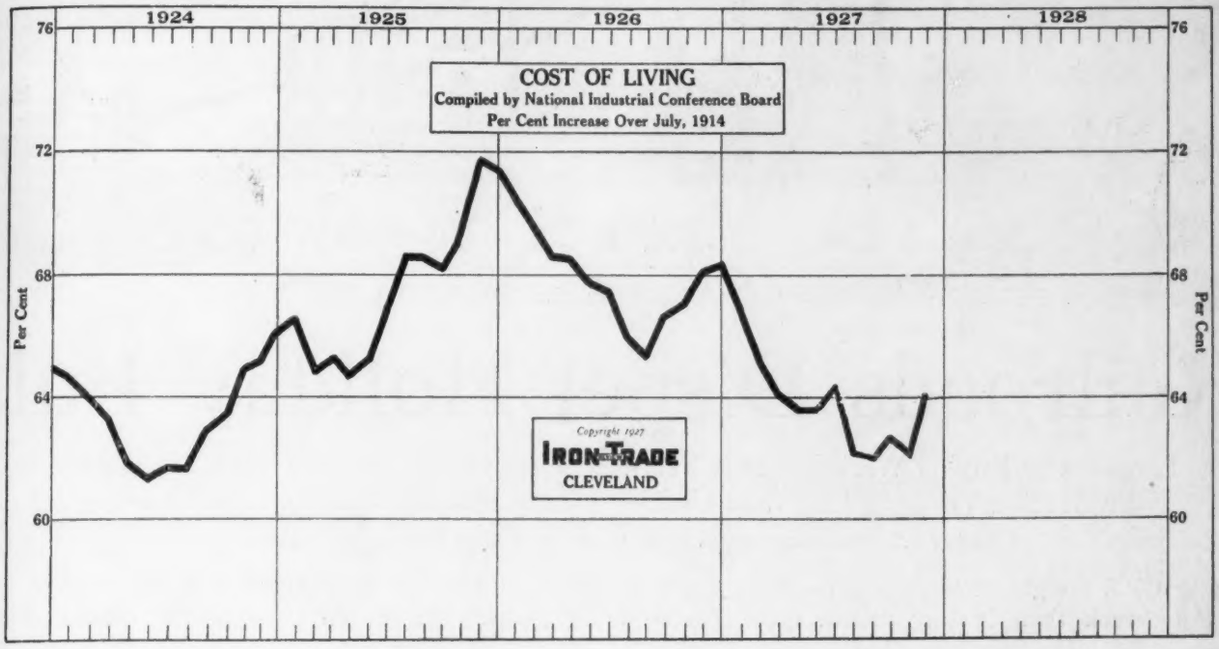
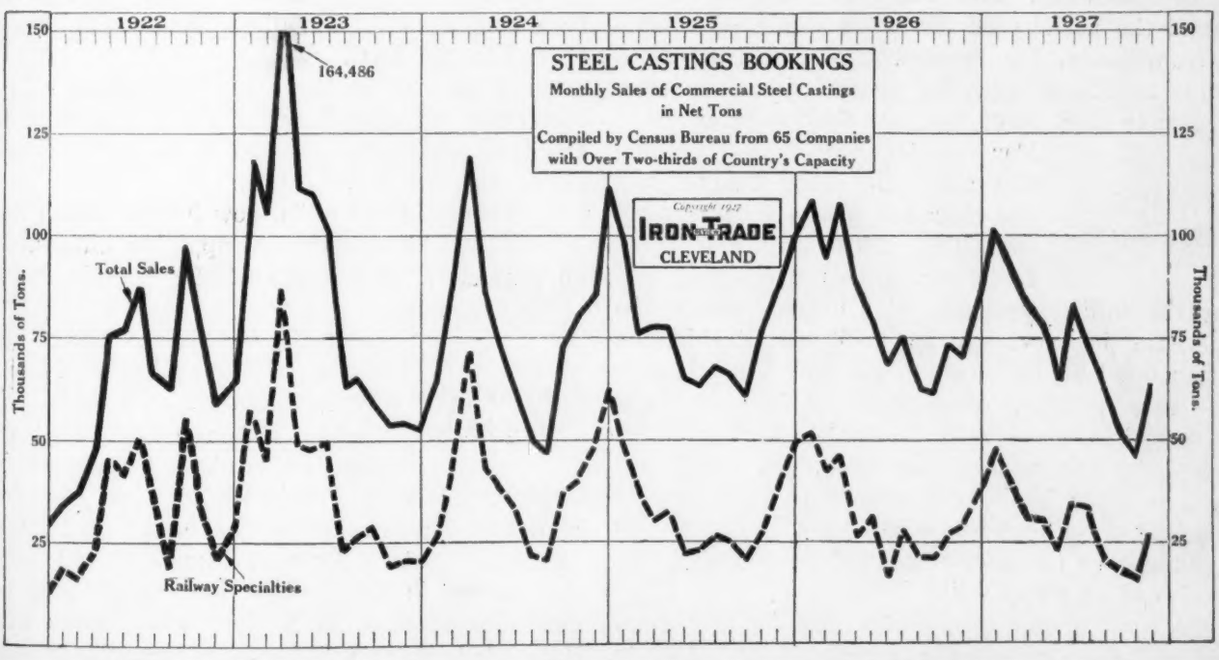


Cost of Living

LIVING costs are upon a lower level than they were one year ago, indicating that the decline in general commodity prices is being reflected in lower retail prices. The index of the cost of living compiled by the national industrial conference board for November stood at 64.2 per cent over the 1914 base. This compares with 68.2 per cent over the 1914 base in November, 1926. In November there was a slight increase in living costs over the index of 63.7 per cent of one month before.

Steel Castings

NOVEMBER brought an important gain in new orders for steel castings. The total bookings for the month amounted to 65,634 tons compared with 49,002 tons in October and with 71,184 tons in November, 1926. The bulk of the gain came from increased buying for railroad account. Orders of railway specialty castings in November were 27,357 tons against 15,375 tons in October and 28,079 tons in November, 1926. Miscellaneous castings orders gained slightly.



Railroads Dispel Holiday Lull

Largest Car Buying Week in Three Years Augments Good Run of General Demand — Production Tapering Less than Usual — Heavy Finished Coverage Continues — Sheet Orders Register Good Gain — Coke is Slightly Higher

MORE freight cars were ordered in the past week than in any month since January. With the Southern placing 4500, the Santa Fe 3650, the Louisville & Nashville 2150 and the Chicago & North Western 1000 additional, the week's total is 11,300, exclusive of small, miscellaneous orders. Steel requirements for these cars will approximate 115,000 tons. More than 15,000 cars are under consideration, and action on almost any one of the inquiries now pending would push the December total past the 14,385 of January and make it the best car month of the year.

The combination of these heavy commitments for cars and fair contracting for track material, including 50,000 tons of rails for the Illinois Central, has completely dispelled the apathy which usually envelops the iron and steel markets Christmas week. Even without this railroad demand the activity of the week would have been extraordinary, for finished steel consumers continue to specify liberally against fourth quarter contracts and cover for the first quarter.

Operations Holding Up

For maintenance of steel production above the usual holiday rate the railroads also are largely responsible. More rail and track fastening orders are being put on the mills, especially at Chicago, where the increase is most marked. There steelmaking has passed 70 per cent on the way up, which is the rate for Steel corporation subsidiaries. Some independent sheet mills in the Mahoning valley are down for repairs this week, but when they resume after New Year they will work against the best order books in a half year. The two-day holiday over Christmas will not be repeated this week end at many mills.

Beehive furnace coke contracting for first quarter has been practically completed at $2.85 to $2.90, levels which anticipate a daily wage cut of $1 per ton in the Connellsville coke regions. Beehive furnace coke is $2.75 to $3 and Connellsville foundry $3.75 to $4.75.

East Behind In Pig Iron

Pig iron sales have been moderately high, with the East still lagging behind the West and South. It is noteworthy that in most districts the larger melters have covered. Shipments at Cleveland, where sales have again topped 50,000 tons in the past week, are equal to the best rate of the year. Producers at Chicago approach the first quarter with heavier order books than a year ago. Southern furnaces are selling into the first quarter at $16, Birmingham, and have booked the equivalent of their January output. In the Pittsburgh district a fair amount of No. 2 foundry iron has been sold at $17.25, Valley. Buffalo prices are shaded in the East.

Chief interest of users of wire products is in specifying out their fourth quarter contracts, and December shipments promise to be much heavier than those of a year ago.

Cold finished bar mills, now holding more firmly to 2.20c, Pittsburgh, are applying differentials on purchases of less than 4000 pounds instead of 6000 pounds.

Consumption Outlook Up

Demand for bars, plates and shapes continues stimulated largely by the prospect of an advancing market, although signs that consumption is about to gain are not lacking. Structural steel inquiry is seasonally high and forecasts unusually heavy lettings for January. Plate mills next month should reflect the current heavy freight car orders and provide new tonnage at a time when users other than car builders will be more engaged in speci-

The Market Section

Comparative Prices of Iron, Steel and Coke

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Dec. 28, 1927	Nov., 1927	Sept., 1927	Dec. 1926
PIG IRON				
Bessemer, valley, del., Pittsburgh	$19.26	19.76	19.86	21.86
Basic, valley	17.00	17.00	17.15	18.80
Basic, eastern del., eastern Pa.	19.50	19.50	19.75	22.25
*No. 2 foundry, del., Pittsburgh	19.01	19.26	19.26	20.86
No. 2 foundry, Chicago	18.50	18.50	19.50	21.00
*Southern No. 2, Birmingham	16.00	16.50	17.25	20.00
*Southern Ohio, No. 2, Ironton	20.00	19.00	19.00	20.00
**No. 2X, Virginia furnace	20.50	21.25	21.50	23.00
**No. 2X, eastern, del. Phila.	20.26	20.51	21.01	23.46
Malleable, valley	17.25	17.50	17.50	19.30
Malleable, Chicago	18.50	18.50	19.50	21.00
Lake Superior charcoal, del., Chicago	27.04	27.04	27.04	27.04
Gray forge, val., del., Pittsburgh	18.51	18.76	18.76	20.56
Ferromanganese, del., Pittsburgh	104.79	94.79	94.79	104.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	2.75	2.80	2.85	3.65
Connellsville, foundry, ovens	3.75	3.75	4.00	4.70
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	34.00	34.00	33.90	36.00
Sheet bars, open-hearth, Pittsburgh	34.00	34.00	33.90	36.00
Billets, open-hearth, Pittsburgh	33.00	33.00	33.00	35.00
Wire rods, Pittsburgh	40.00	41.00	43.00	45.00
FINISHED MATERIAL				
Steel bars, Pittsburgh	1.80	1.75	1.80	2.00
Steel bars, Chicago	1.90	1.85	1.85	2.10
Steel bars, Philadelphia	2.12	2.07	2.07	2.32
Iron bars, Philadelphia	2.07	2.07	2.07	2.22
Iron bars, Chicago	1.90	1.85	2.00	2.00
Shapes, Pittsburgh	1.80	1.75	1.80	2.00
Shapes, Philadelphia	2.08	2.07	2.02	2.22
Shapes, Chicago	1.90	1.85	1.85	2.10
Tank plates, Pittsburgh	1.80	1.75	1.80	1.90
Tank plates, Philadelphia	2.05	2.07	2.07	2.22
Tank plates, Chicago	1.90	1.85	1.85	2.10
Sheets, black, No. 24, Pittsburgh	2.75	2.80	3.00	3.00
Sheets, blue anl., No. 10, Pittsburgh	2.10	2.10	2.25	2.30
Sheets, gal., No. 24, Pittsburgh	3.60	3.70	3.85	3.90
Sheets, black, No. 24, Chicago	2.95	3.00	3.15	3.25
Sheets, blue anl., No. 10, Chicago	2.25	2.30	2.40	2.55
Sheets, galvanized, No. 24, Chicago	3.80	3.85	4.00	4.10
Wire nails, Pittsburgh	2.45	2.50	2.55	2.65
Wire nails, Chicago	2.55	2.55	2.60	2.70
Tin plate per base box, Pittsburgh	5.25	5.30	5.50	5.50
OLD MATERIAL				
Heavy melting steel, Pittsburgh	15.50	14.20	15.00	17.00
Heavy melting steel, eastern Pa.	14.00	14.00	14.00	15.70
Heavy melting steel, Chicago	12.25	11.50	12.20	13.00
No. 1 wrought, eastern Pa.	15.75	15.75	15.75	17.00
No. 1 wrought, Chicago	12.00	11.25	12.70	13.75
Rails for rolling, Chicago	14.50	13.95	15.20	16.30

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (December 28, 1927)	$35.07
Last week (December 21, 1927)	35.09
One month ago (November, 1927)	35.35
Three months ago (September, 1927)	36.18
One year ago (December, 1926)	38.22
Ten years ago (December, 1917)	56.68
Fourteen years ago (December, 1913)	23.29

fying than in contracting. Car floats and barges which the New York Central railroad will place call for 5000 tons of plates, while 4400 tons will be required for two colliers for an eastern coal interest. Specifications for bars at Chicago have expanded to the point where it is more difficult to sandwich in odd lots.

Indicative of the new life manifest in sheets are reports of independent producers that production in the first half of December has approximated 275,000 tons compared with 230,041 tons for all of November. Unfilled orders as of Dec. 15 are estimated at 626,000 tons, against 437,306 tons Nov. 30. Particularly in the Pittsburgh and Youngstown districts have makers experienced heavier specifications and orders.

Pacific coast quotations on heavy finished steel have been reduced practically $1 per ton by the new eastern mill bases announced by the Bethlehem Steel Co.

Weakness in Virginia pig iron has reduced the IRON TRADE REVIEW composite of 14 leading iron and steel products 2 cents this week, to $35.07.

Late News Flashes

Holidays No Deterrent at Chicago

Chicago, Dec. 27.—Rail mill operations in this district are being advanced again this week, to above 75 per cent. Track fastenings output will be stepped up to above 60 per cent early in January. It is reported that the steel ingot rate in this district is higher than blast furnace operations would indicate and that this rate now is fully 70 per cent. Twenty-one of the 36 steelworks blast furnaces are active.

Higher Duty on Cast Pipe Is Asked

Washington, Dec. 27.—Application has been made to the United States tariff commission for an increase in the duty on cast iron pipe, which is now 20 per cent ad valorem.

Merger Negotiations Being Completed

Cleveland, Dec. 27.—Negotiations for the merger of six independent sheet steel producers were being completed here today in a conference of bankers and company executives. A definite decision to proceed with or terminate negotiations was to be reached.

More Open Hearths On in Valley

Youngstown, O., Dec. 27.—Two additional open hearths have been placed in operation today, making 33 out of 53 independent furnaces active. However, four independent sheet plants are idle today for needed repairs and inventories, making 70 units active out of 127, against 95 active last week. All are expected to resume on Jan. 3, most of them in full. Wrought pipe, strip and tin plate operations remain unchanged, but a slight improvement in bar mill activities is taking place.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$33.00
Pittsburgh, bessemer	33.00
Youngstown	33.00
Cleveland	33.00
Philadelphia	38.30 to 39.30
Chicago	33.00
Forging, Pittsburgh	39.00
Forging, Philadelphia	43.30 to 44.30

SHEET BARS

Pitts., Young., and Cleve.	$34.00

SLABS

Pitts., Young., and Cleve.	$33.00

WIRE RODS

Pittsburgh	40.00 to 42.00
Cleveland	40.00
Chicago	42.00 to 43.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

All grades, Pittsburgh	1.80c

Standard Structural Shapes

Pittsburgh	1.80c
Philadelphia	2.07c to 2.08c
New York	2.09c to 2.14c
Chicago	1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.35c

Steel Plates

Pittsburgh	1.80c
Philadelphia	2.05c
New York	2.125c
Chicago	1.90c
Cleveland	1.99c
Birmingham	1.95c to 2.05c
Pacific coast, c.i.f.	2.40c

Iron and Steel Bars

Pittsburgh, soft steel	1.80c
Pittsburgh, cold finishing	1.95c
Pittsburgh, forging quality	1.95c
Philadelphia, soft steel	2.12c
New York, soft steel	2.14c
Chicago, soft steel	1.90c
Cleveland, soft steel, mill	1.80c
Cleveland, soft steel, del.	1.82½c and 1.99c
Birmingham, soft steel	1.95c to 2.05c
San Francisco, soft steel	2.35c
Pittsburgh, refined iron	2.75c to 4.25c
Pittsburgh, reinforcing billet	1.80c to 1.90c
Chicago, reinforcing billet	2.20c to 2.75c
Chicago, reinforc. rail steel	1.80c to 1.90c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.80c to 1.85c
Mill, rail steel	1.65c to 1.75c
Philadelphia, common iron	2.07c to 2.22c
New York, common iron	2.09c to 2.24c
Chicago, common iron	1.90c

Hoops, Bands, Strips

Hoops, Pitts., 6 in. and under	2.10c to 2.30c
Bands, Pitts., 6 in. and under	2.10c to 2.30c
Bands, Pittsburgh, over 6 in.	1.90c to 2.00c
Hot rolled strip, Pitts., stamping quality, over 6 in.	1.85c to 1.90c
Hot rolled strip steel, Chicago	2.10c to 2.40c
Bands, Chicago, under 6-in.	2.30c to 2.40c
Bands, Chicago, 6 in. and over	2.10c to 2.20c
Cold rolled strip steel, hard coils, 1½ inches and wider by 0.100-inch and heavier base, Pittsburgh, Cleveland (less than 3 tons)	3.00c to 3.15c
Worcester, Mass.	3.15c to 3.40c
Stripsheets, with blue annealed extras, 12 in. and wider, Pittsburgh	2.10c

Cold Finished Steel

Cold finished steel bars, drawn or rolled, Pitts., Chi., c.l.	2.20c
Steel shafting, Pittsburgh, Chicago	2.30c
Cold finished steel bars, Cleve.	2.20c

Chain, Piling, Cut Nails

Cut nails, c.l., f.o.b. mills	2.80c
Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.20c to 2.25c

Alloy Steel

Hot Rolled

F.o.b. Pittsburgh or Chicago

To Tonnage Users in Auto. Industry

S.A.E. Series Number	100 lbs. Bars
2100 (*½ per cent Ni. 0.10 to 0.20 per cent C)	$2.90 to 3.00
2300 (3½ per cent nickel)	4.00 to 4.10
2500 (5 per cent nickel)	5.00 to 5.10
3100 (Nickel chromium)	3.00 to 3.10
3200 (Nickel chromium)	4.50 to 4.75
4100 (Chromium molybdenum)	3.00 to 3.10
4100 (Cr. Mo. 0.25-0.40)	3.90 to 4.05
4615 (Ni. 1.50%; Mo. 0.10-0.20)	4.25 to 4.50
5100 (Chromium steel)	3.10 to 3.20
6100 (Cr. V., forging)	4.00 to 4.10
6100 (Cr. V., spring)	3.60 to 3.80
9200 (Silico Mang., spring steel)	3.00 to 3.20
9250 (Silico Mang., spring steel)	3.00 to 3.10
Ni. Cr. V., (Ni. 1½%, Cr. 1% V. 0.15%)	4.00 to 4.10

*Mill number not formally accepted by S. A. E.

Hot rolled alloy billets 4 x 4-inch and over take the same prices per gross tons as same specification of alloy bars per net ton. Sizes from 4 x 4-inch down to 2½ x 2½-inch take same basis plus $5 a ton extra. Billets smaller than 2½ x 2½-inch take bar price on net ton basis.

Cold Rolled

Cold rolled alloy steels take 1c a pound extra over hot rolled when mean carbon is 0.30 or under. When the carbon is above 0.30 the extra for cold rolled is 1.75c, including annealing.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	2.75c to 2.90c
No. 24, Philadelphia, delivered	3.22c
No. 24, Gary, Indiana Harbor	2.90c to 3.00c
No. 24, Chicago, delivered	2.95c to 3.05c
No. 24, Birmingham, base	3.05c

TIN MILL, BLACK

No. 28, Pittsburgh	2.90c to 3.00c
No. 28 Gary, base	3.00c to 3.10c

GALVANIZED

No. 24, Pittsburgh base	3.60c to 3.75c
No. 24, Philadelphia delivered	4.07c
No. 24, Gary, Indiana Harbor	3.75c to 3.85c
No. 24, Chicago, delivered	3.80c to 3.90c
No. 24, Brimingham, base	3.90c

BLUE ANNEALED

No. 10, Pittsburgh, base*	2.10c
No. 10, Philadelphia, delivered	2.42c
No. 10, Gary, Indiana Harbor	2.20c to 2.30c
No. 10, Chicago, delivered	2.25c to 2.35c
No. 10, Birmingham base	2.30c

*Plus 10 cents on material 40 inches or wider.

AUTOMOBILE

No. 28 Pittsburgh, base	4.60c to 4.15c

IHON

No. 10, Pitts., blue ann., c.l.	2.90c
No. 24, Pitts., box annealed, 1-pass cold rolled, carload	3.85c
No. 24, Pitts., gal., c.l.	4.85c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.25

Gary, Ind., base 10 cents higher.

Long ternes, primes, No. 24	4.10c

*Prices subject to quantity differentials.

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.O.B. Cleveland and Pittsburgh base

Bright plain wire, No. 9 gage	2.35c to 2.40c
Annealed fence wire	2.50c to 2.55c
Galvanized wire, No. 9 gage	2.95c to 3.00c
Barbed wire, painted	2.95c to 3.00c
Barbed wire, galvanized	3.20c to 3.25c
	Per 100 lbs.
Wire nails	$2.45 to 2.55
Galvanized nails	4.45c to 4.50c
Polished staples	2.90c to 3.00c
Galvanized staples	3.15c to 3.25c
Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra, base	2.45c to 2.55c
Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts.	$20.03

Joliet, DeKalb and Waukegan, Ill., Anderson, Ind., and Chicago prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relay, rails, Pitts. 60 to 70 lb.	25.00 to 27.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.70c to 2.80c
Spikes, small railroad, 7-16-inch and smaller, Pitts.	2.80c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.80c
Track bolts, Pitts. stand	70 off list
Track bolts, Chicago	3.80c
Tie plates, Chicago, Pitts.	2.25c

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less, Chicago del., 2½ points less

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b Pittsburgh Mills

Steel 3¼ to 3¾-inch	38½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents for carloads or six 5 per cents for less-carload on lap welded steel. On seamless hot rolled several more 5 per cents, and on charcoal two 10 per cents to two 10 and one 5 per cents.

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Six-inch and over, Birming'm	$29.00 to 30.00
Four-inch, Birmingham	33.00 to 34.00
Four-inch, Chicago	40.20 to 42.20
Six-inch to 24-inch, Chicago	36.20 to 38.20
Four-inch, New York	40.25 to 41.60
Six-inch and over, New York	37.25 to 38.25
Standard fittings, Bir. base	$100.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $4 higher than Class B

Bolts and Nuts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Discounts are for legitimate jobbing or large consuming trade purchasing in full-case lots, apply to lists of April 1, 1927. Small lots are 55 to 60 per cent off.

CARRIAGE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Eagle list	70 off

MACHINE BOLTS

All sizes, cut thread	70 off

Rolled thread ⅝x6 and smaller take 10 per cent lower list.

Lag screws	70 off
Plow bolts, Nos. 1-2-3-7 heads	70 off
Tap bolts	70 off
Blank bolts	70 off
Stud bolts without nuts	70 off
Stove bolts, 80-10-5 off in packages; 80-10-5 with 2½ off in bulk.	
Tire bolts	60-5 off

NUTS

Semifinished	70 off

HEXAGON CAP SCREWS

Milled	80-10-10 off
Upset 1-in. diam. and smaller	85-5 off

SQUARE HEAD SET SCREWS

Milled	80-10 off
Upset, 1-in. diam. and smaller	80-10-10 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.75c
Structural rivets, c.l., Chicago	2.85c to 3.10c
**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland and Chicago	70 and 10 to 70, 10 and 5 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought, c.l., Chicago dist.	$6.70 to 6.90 off
Wrought, c.l., Pitts. dist.	6.75 off
Lock washers (dealers')	85-5 off
Lock washers (consumers)	85 off

Pig Iron

Demand for First Quarter Continues Active —Important Consumers Close—Birmingham Tonnage Taken at $16

PIG iron demand in those districts that have been active recently did not slow down much for the holiday season. Buying is heavy at Chicago, furnace interests approaching the new year with more tonnage on their books for first quarter than they had for the like period of 1927. A Milwaukee melter is inquiring for 5000 tons, while a Michigan-Wisconsin foundry interest wants several thousand tons. Sales reported for the past week by makers with headquarters at Cleveland amounted to 52,000 tons, largely due to expansion of orders from the automotive industry. The General Electric Co. has closed for 3000 tons for eastern plants; the National Radiator Co., and United States Sanitary Mfg Co. also have placed substantial tonnages.

PITTSBURGH, Dec. 27.—Pig iron market activity is fair in foundry grades. The price still is $17.25, base, valley, despite efforts of one or two producers to raise it to a minimum of $17.50. The National Radiator Co. which bought extensively for Johnstown, Pa., and Trenton, N. J., from a Pennsylvania steelworks interest, and for Framingham, Mass., from the Everett, Mass., producer, has purchased a round tonnage from two or three valley makers at $17.25, base, valley. The United States Sanitary Mfg. Co., Monaca, Pa., is reported to have closed a large tonnage with a valley merchant stack on the same basis. One or two 200-ton to 500-ton lots recently carried the same figure. Several inquiries for moderate size lots are pending. Many deals have been arranged lately by purchasers with regular sources of supply on a reciprocity basis. While nothing is noted in the market for basic iron, this grade continues quotable nominally at $17, valley. A small additional amount of bessemer iron has been closed at $17.50, valley, including one lot of 200 tons. Low phosphorus iron is held at $27, valley.

Boston, Dec. 27.—The General Electric Co. has placed 1400 tons of pig iron for use in its three New England plants with the Mystic Iron Works, Everett, Mass. Other sales of pig iron in the local market in the past week totaled approximately 6000 tons, more than half of which went to Buffalo and eastern furnaces. Virginia iron appears easier, but still is far out of line with northern iron. Small sales are noted.

New York, Dec. 27.—General Electric Co. has taken action on its recent inquiries for 3040 tons of foundry iron for first quarter shipment to its plants at Pittsfield, Lynn and Everett, Mass., Schenectady, N. Y., and Bayway, N. J., and is believed to have placed the entire tonnage. The total placed in the past week, aside from the General Electric Co.'s business, probably did not exceed 2500 tons, the largest single order being one for 500 tons. Current inquiry does not exceed 1000 tons. It is estimated that 75 per cent of the iron to be consumed in first quarter is in consumer's hands or is due them on orders. This figure allows for a considerable amount accumulated at foundries as a result of curtailed operations the last few months. Iron at blast furnaces apparently is larger than in some years. While some Buffalo makers continue at $17, base, furnace, on foundry iron, others will go as low as $16 to $16.50 on attractive orders when necessary to equalize freights. Not all business is placed on the basis of price, and one New England consumer the past week placed 500 tons of foundry iron with a distant maker, paying approximately $3 a ton higher than the delivered market in New England. Eastern Pennsylvania foundry iron continues $19, base, furnace. Business in foreign iron is restricted to occasional small lots of Indian and Dutch foundry iron, which continue to bring premiums because of their high silicon contents. Witherbee, Sherman & Co. definitely have scheduled one of their furnaces at Port Henry, N. Y., to be placed in blast the first week in January.

Pig Iron Prices

Per gross ton

Bessemer, valley furnace	$17.50
Bessemer, del. Pittsburgh	19.26
Basic, valley furnace	17.00
Basic, del., Pittsburgh	18.76
Basic, Buffalo furnace	16.50 to 17.00
Basic, del., eastern Pa.	19.25 to 19.75
Malleable, valley furnace	17.25 to 17.50
Malleable, del Pittsburgh	19.01 to 19.26
Malleable, del. Cleveland	18.50
Malleable, Chicago furnace	18.50
Malleable, Buffalo furnace	17.50
Malleable, del. eastern Pa.	20.00 to 21.00
No. 1 foundry, Chicago furnace	19.00
No. IX, eastern del., Phil.	20.76 to 21.26
No. IX, Buffalo furnace	18.00 to 18.50
No. 2 foundry, valley furnace	17.25 to 17.50
No. 2 foundry, del., Pittsburgh	19.01 to 19.26
No. 2 fdy., Everett, Mass., fur.	19.00 to 21.00
No. 2 foundry, Buffalo furnace	17.00
No. 2 foundry, Chicago furnace	18.50
No. 2 foundry, Granite City	19.50 to 20.00
No. 2 foundry, Ironton furnace	19.00
No. 2 foundry, del. Cleveland	18.50
No. 2 foundry, del. Phila.	19.76 to 20.26
No. 2 Virginia furnace	20.50
No. 2 foundry, N. J., tidewater	19.28 to 21.26
No. 2 foundry, east N. Y. fur.	18.00 to 20.50
No. 2 Alabama, Birmingham	16.00
No. 2 Alabama, del. Cincinnati	19.69
No. 2 Tenn., Birmingham base	16.00
No. 2 Tenn., del., Cincinnati	19.69
No. 2 Alabama, del. Philadelphia	22.01
No. 2 Alabama, del. Chicago	22.01
No. 2 Ala., del. Chicago, river-rail	20.18
No. 2 Ala., del. Boston, rail-water	22.91 to 24.77
No. 2 Alabama, del. Cleveland	22.01
No. 2 Alabama, del. St. Louis	20.42
No. 2X east, N. J., tidewater	19.78 to 21.76
No. 2X, eastern, del. Phila.	20.26 to 20.76
No. 2X, foundry, Buffalo furnace	17.50
No. 2X, eastern, del. Boston	23.15 to 23.65
No. 2X, Virginia furnace	20.50 to 21.00
No. 2X, Virginia, del. Phila.	25.04 to 25.54
No. 2X, Virginia, del. Jersey City	25.37 to 25.87
No. 2X, Virginia, del. Boston	25.71 to 26.21
Gray forge, val., del., Pittsburgh	18.51 to 18.76
Low phos., standard, valley	27.00
Low phos., standard, Phila.	24.76 to 27.79
Low phos., copper bearing fur.	23.00 to 24.00
Charcoal, Birmingham	29.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron, Jackson county (Ohio) furnace, in per cents: 5—$22; 6—$23; 7—$24; 8—$25; 9—$26; 10—$28; 11—$30; 12—$32; 13—$34.

Bessemer ferrosilicon, Jackson county (Ohio) furnace, in per cents; 10—$30; 11—$32; 12—$34; 13—$36; 14—$38; 15—$40.50; 16—$43.

Buffalo, Dec. 27.—Beneath the quiet surface there is considerable activity in pig iron in this district. A fair volume of business has been booked and there is probably 2000 tons of inquiry pending. Buffalo furnaces report taking all business in this immediate district at $17 for low silicon foundry and $17.50 for malleable but admit hearing that silicon differentials have been waived on some outside business. Releases for shipment after Jan. 1 indicate melt is expected to improve considerably.

Youngstown, Dec. 27.—Accumulating orders for pig iron gradually are coming to blast furnace interests in this district, this especially being true of foundry grades. Basic iron transactions are infrequent. While the usual price for the larger tonnages is $17.25, furnace, small lots of foundry grades bring $17.50.

Chicago, Dec. 27.—Pig iron inquiry is decidedly active, both for small lots and heavy tonnage. A Milwaukee melter is inquiring for about 5000 tons of mixed grades, including silvery. A local industrialist wants to buy several thousand tons for his foundries in Michigan and Wisconsin, including silvery and charcoal iron. Sellers are accumulating heavy first quarter tonnage, and are entering the new year with first quarter books ahead of the similar period in 1927. December sales are slightly ahead of November. Spot buying is steady. Small tonnages of boat iron are stored against certain orders, but are having no effect on the market which is decidedly firm at $18.50, base. The Mayville, Wis., furnace is expected to go out about the middle of next month, and probably one or two south Chicago merchant stacks also, as stocks are well balanced.

Cleveland, Dec. 27.—The pig iron market continues fairly active, due

(*Concluded on Page* 1637)

Coke

Connellsville Coke Contracts for First Quarter Anticipate Wage Reduction—Foundries Wait

THAT a wage reduction is in prospect in the Connellsville coke region about Jan. 1 is further indicated by first quarter contract prices recently closed with a number of blast furnace interests. The prices range from $2.85 to $2.90, based on a wage reduction of about $1 a day. Some operators are understood to be contemplating a heavier cut.

Pittsburgh, Dec. 27.—With beehive coke contracting for first quarter practically completed, at the flat prices of $2.85 and $2.90 by blast furnaces now operating, present activity in the market is limited to a small amount of day-to-day buying. The Shenango Furnace Co., Sharpsville Furnace Co., Stewart Iron Co., and Tonawanda Iron Co. closed for their requirements. It is understood the E. & G. Brooke Iron Co. purchased by-product coke in the East. With pig iron market conditions poor, additional furnaces do not have an incentive to go into blast. Contract furnace coke prices still are quoted at $2.85 to $3. The minimum for spot delivery now is $2.75. Medium sulphur and heating coke is available at $2.65. Wage reductions to the 1917, or $5, scale slated for Jan. 1 are discounted by these levels of coke prices. Some small coke operations may even cut wages below the 1917 scale. The H. C. Frick Coke Co.'s scale is expected to be modified from a $7 to a $6 basis, although no formal announcement has yet been made. Purchasing of foundry coke has been halted for the present, customers waiting to see the effect of the anticipated wage cut. Some producers now quoting $4.75 are expected to drop to $4.25. Nothing except medium sulphur coke is available below $3.75.

Production of coke in the Connellsville region in the week ended Dec. 17 was 41,460 tons, compared with 41,020 tons the preceding week, according to the *Connellsville Courier*.

Boston, Dec. 27.—Demand for foundry coke continues quiet. The reduction of 50 cents by both the New England by-product coke manufacturers has failed to stimulate demand. The price is $11.50, delivered, at New England consuming points.

New York, Dec. 27.—Foundrymen in this territory and New England generally have renewed contracts covering their first half coke requirements. The two New England and the northern New Jersey by-product coke producers, under these contracts, will bill their shipments as usual at the price prevailing at the time of shipment. The contract prices on beehive foundry usually are $5.10 to $5.35, Connellsville. Current prices are $11.50, delivered to representative New England consuming points, on by-product foundry coke; $8.75 northern New Jersey ovens or $9.59 to $10.77, delivered at Newark and nearby points, on by-product foundry coke; $4 to $4.25, Connellsville, on beehive foundry coke, with occasional sales of distress lots of beehive coke at less. There is some contracting at this time in beehive furnace coke for first quarter shipment, the price for general industrial purposes ranging from $2.75 to $3, Connellsville. Generally, demand for coke is quiet.

Buffalo, Dec. 27.—Demand for foundry coke continues slow, but producers look for improvement after Jan. 1. Domestic coke is moving more freely because of a prolonged cold snap. Prices are $7 for domestic coke and $9 for foundry, Buffalo ovens.

Cincinnati, Dec. 27.—Foundry coke specifications fell off due to light operations in the holiday season. However, one of the largest by-product coke manufacturers in the country has run behind orders, for about two weeks, mainly because of larger specifications by automobile manufacturers. Prices are unchanged.

Chicago, Dec. 27.—By-product foundry coke shipments have declined slightly over the holiday period. Prices are firm at $9, ovens, and $9.50, delivered Chicago.

Detroit, Dec. 27.—Demand for foundry coke is light but the general tone of the market is improved. Foundry production this month has shown some improvement over November and increased production is scheduled for January. The foundry coke price remains $9, ovens.

Birmingham, Ala., Dec. 27.—Little interruption is noted in coke production, and shipments are steady. By-product foundry coke is $5, Birmingham.

Coke Prices

Beehive Ovens	
Prices per Net Ton	
Connellsville furnace	$2.75 to 3.00
Connellsville foundry	3.75 to 4.75
New River foundry	7.00 to 8.00
New River furnace	6.00
Wise county, foundry	5.00
Wise county, furnace	4.50
Alabama foundry	5.50
By-Product	
Foundry, Newark, N. J., del.	9.59 to 10.77
Foundry, Chicago, ovens	9.00
Foundry, New England, del.	11.50
Foundry, St. Louis	9.75
Foundry, Birmingham	5.00
Foundry, Indianapolis, del.	9.75
Foundry, Ashland, Ky.	7.50
Foundry, Portsmouth, O.	7.50
Foundry, Detroit, ovens	9.00
Foundry, Buffalo, ovens	9.00

Ferroalloys

Spiegeleisen Sold at $33 in Some Instances—Ferromanganese Covered

New York, Dec. 27.—Most consumers, including important ones, have placed their ferromanganese requirements over the first half of 1928, on the basis of $100, duty paid, tidewater. Specifications on second half contracts continue heavy, consumers generally being inclined to lay in as much tonnage at the old $90 price as possible.

Spiegeleisen producers have advanced their price to $32, furnace, for the 19 to 21 per cent grade and a number of sales involving carloads to 100 tons each, for shipment over the next two months, have been made.

Tungsten ore is not so strong as recently, and wolframite now is $10.35 to $10.50 a short ton unit, duty paid.

Pittsburgh, Dec. 27.—Without spot demand and with specifications slow to materialize on new arrangements for all or part of 1928, the ferroalloys market is quiet. Most ferromanganese consumers enter the new year with fair size stocks accumulated on low-price contracts. The ferromanganese price of $100, Atlantic seaboard base, is upheld. Most consumers are protected with requirement contracts guaranteed against declines.

Since the advance in the price of Spiegeleisen Dec. 20, some sales have been made in this territory at $33, while other sales have been closed at $32, depending on tonnage. This has been made possible by the higher price of ferromanganese. Spiegeleisen shipments are heavy for December and specifications are already developing for January shipment. Specifications on 50 per cent ferrosilicon and other ferroalloy contracts are putting in their appearance slowly. No spot demand is encountered anywhere.

Chicago, Dec. 27.—Practically no contracting for ferromanganese is noted beyond the first half. Ferrosilicon contracting is well along, but several important buyers are holding out. Practically no activity is noted in spiegeleisen.

Ferroalloy Prices

Ferromanganese, 78 to 82 per cent, tidewater, duty paid	$100.00
Ferromanganese, del., Pittsburgh	104.79
Spiegeleisen, 19 to 21 per cent domestic furnace	32.00 to 33.00
Ferrosilicon, 50 per cent, freight allowed, 1928 contracts, carloads	83.50
Ferrochrome, 66-70 chromium, 4-6 carbon, cts. per lb. con., del.	11.00
Ferrotungsten stand. lb. cont.	95.00
Ferrovanadium, 30-40 per cent, per lb. contained, on analysis	3.15 to 3.65
Ferro-carbon-titanium carload producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18%)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23-25% f.o.b. Anniston, Ala., (24 per cent)	122.50

Plates

December Orders Far Outstripping November's—Large Boat Tonnage in Prospect

MISCELLANEOUS plate orders are exceeding those for November, in some instances December tonnage being twice as heavy as in the former month. The New York Central is reported planning four car floats and 15 barges, while prospective government work includes 80 pontoons, two barges and two maneuver boats, all taking steel plates. Prices are steady.

PLATE PRICES, PAGE 1622

Pittsburgh, Dec. 27.—Plate specifications lack the speculative element. The tonnage is applied against low priced contracts which expire Dec. 31. New contracts on the higher basis for first quarter have not been touched yet, but it is believed they will be the middle of January. Numerous customers have assured the mills that they will commence to take out this material at an early date. Fairly large tonnages of plates will be involved in government work in January, including 80 pontoons for Memphis, two barges for Montgomery, Ala., and two steel maneuver boats for Pittsburgh. Possibly the largest tonnage pending is a promised inquiry by New York Central to develop for four car floats and 15 barges.

Philadelphia, Dec. 27.—Berwind White Coal Co. is inquiring for two coastwise colliers estimated to require about 2200 tons of steel each.

General demand is fair. Producers continue to adjust prices to an f.o.b. Coatesville base where this results in the lowest delivered prices. The market continues quotable at 1.95c, base, Coatesville, equivalent to 2.05c, Philadelphia.

Cleveland, Dec. 27.—The best month of the last half year is closing for sellers of plates in this district. An unusually large number of users have contracted for first quarter. There is further talk of the present 1.80c, Pittsburgh, level being stepped up to 1.90c shortly.

Chicago, Dec. 27.—Light and heavy structural demand for plates as well as shipments to the general manufacturing line holds up well. No new oil tank tonnage has been placed the past two weeks. Interest continues active in first quarter contracting, on the basis of 1.90c, Chicago.

CONTRACTS PLACED

620 tons, pipe line, Ventura, Calif.; general contract awarded to Claude Fisher, Los Angeles.

300 tons, dipper derrick hull for Monongahela & Ohio River Dredging Co., Pittsburgh, with two dump scows, to Dravo Contracting Co.

200 tons, two pile driver hulls for Merrick, Chapman & Scott, New York, to Dravo Contracting Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

5000 tons, estimated, four car floats and 15 barges for New York Central railroad's marine department; bids to be taken shortly after Jan. 1.

3000 tons, 12-mile pipe job, Port Townsend, Wash.; bids in.

1600 tons, eighty 21-foot pontoons with 40 pieces of riveted pipe 40 feet long by 18 inches in diameter for the United States Engineers, Memphis, Tenn.; bids close Jan. 3.

750 tons, pipe line for Forest Grove, Oreg.; bids in.

300 tons, two barges for United States engineers, Montgomery, Ala.; bids being taken.

250 tons, navy department for Mare Island Yard, Calif.; bids in Jan. 3 under schedule 8215.

200 tons, two steel maneuver boats for United States engineers, Pittsburgh; bids close Jan. 19.

175 tons, pontoon pipe for United States engineers' office, San Francisco; plate to be ½-inch thick.

Struthers Reorganization Plan Announced

Properties of the Struthers Furnace Co., Struthers, O., now in receivership, are to be offered at foreclosure sale and if no satisfactory bid is received a bondholders' protective committee is to bid in the properties and make effective a plan of reorganization which has been agreed upon.

A new Ohio corporation, probably called the Struthers Iron & Steel Co., will be formed. Securities issued will include a maximum of 10,000 shares of no part common, $1,815,000 in first preferred 6 per cent and $200,000 in second preferred 6 per cent stock. On the board of directors will be W. C. Holzworth, Hugh W. Grant, J. H. Hillman Jr., Max Breitung and E. G. Tillotson.

Semifinished

Makers Open Books for First Quarter, Quoting Present Prices —Demand Is Moderate

PRODUCERS of billets, slabs and sheet bars have opened their books for first quarter, with prices the same as those prevailing through the past three months. While some consumers have made arrangements with regular sources of supply covering their requirements for the quarter, business generally continues limited to order for about a month in advance. Demand is not brisk.

SEMIFINISHED STEEL PRICES, PAGE 1622

Pittsburgh, Dec. 27.—The market for semifinished steel is quiet. A few sales involving January shipments of billet and slab to users in nearby districts were made recently, and shipments will start early next month. All quote $33 on billets and slabs, and $34 appears to be the market price on sheet bars, although the latter is not fully tested. Small lots of forging billets are being delivered to the forge shops from time to time, and $38 holds on first quarter contracts. While some makers of wire rods still ship against $41 and even $40 contracts, none is being accepted for first quarter at less than $42. Skelp is 1.80c, but current shipments are being billed at as much as $2 per ton under that level.

Youngstown, O., Dec. 27.—Conviction appears to be growing that semifinished steel quotations will not change for first quarter, because of growing firmness in the sheet and strip steel markets. Sheetmakers as well as strip mills appear more interested in the market at present than are the usual billet customers.

Lukens Gets Drawback

Washington, Dec. 27.—Treasury department has announced the allowance of draw-back on steel plates manufactured by the Lukens Steel Co. of Coatesville, Pa., with the use of imported pig iron, iron and steel scrap. ferromanganese and fluorspar.

Finds No Steel Dumping

Washington, Dec. 27.—Secretary of the Treasury Mellon has stated that he does not find justification for a dumping order on steel products from Germany. However, importations will be closely watched and appropriate action taken, if necessary.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross tons Delivered to Consumers

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	10.50 to 10.75
Boston (dealers)	9.00 to 9.25
Buffalo, No. 1	14.50 to 15.00
Buffalo, No. 2	12.50 to 13.00
Chicago	12.25 to 12.75
Cincinnati (dealers)	11.25 to 11.75
Cleveland, No. 1	13.50 to 13.75
Cleveland, No. 2	13.25 to 13.50
Detroit, No. 1	11.25 to 11.75
Eastern Pennsylvania	13.50 to 14.00
Eastern Pennsylvania, No. 2	10.50 to 11.50
Bethlehem delivery	13.00 to 13.50
New York (dealers) (railroad)	10.00 to 10.85
New York (dealers) (yard)	7.00 to 7.50
Pittsburgh, No. 1	15.50 to 16.00
St. Louis	12.00 to 12.50
Valleys, No. 1	14.75 to 15.00

COMPRESSED SHEETS

Buffalo	11.50 to 12.00
Chicago	10.75 to 11.25
Cleveland	12.50 to 13.00
Detroit	10.25 to 10.75
Pittsburgh	14.00 to 14.50
Valleys	13.50 to 14.00

BUNDLED SHEETS

Buffalo	8.75 to 9.25
Cincinnati (dealers)	9.50 to 10.00
Cleveland	11.50 to 12.00
Eastern Pennsylvania	10.50 to 11.00
Pittsburgh	13.00 to 13.50
St. Louis	7.75 to 8.25

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	9.00 to 9.50
Detroit	7.75 to 8.25
St. Louis	7.50 to 8.00

STEEL RAILS, SHORT

Birmingham	11.50 to 12.00
Buffalo	16.00 to 16.50
Chicago	14.50 to 15.00
Cincinnati (dealers)	16.00 to 16.50
Detroit	11.00 to 11.50
St. Louis	15.25 to 15.75

STOVE PLATE

Birmingham	13.00 to 14.00
Boston (consumers)	11.00 to 11.50
Buffalo	12.75 to 13.25
Chicago (net)	12.00 to 12.50
Cincinnati (dealers) net	9.50 to 10.00
Cleveland	12.00 to 12.50
Detroit (net tons)	10.50 to 11.00
Eastern Pennsylvania	12.50
New York (dealers) (mill)	8.25 to 8.50
Pittsburgh	12.50 to 13.00
St. Louis	13.50 to 14.00

LOW PHOSPHORUS

Buffalo, billet and bloom crops	16.50 to 17.00
Cincinnati (dealers)	13.00 to 13.50
Eastern Pennsylvania	17.50 to 18.50
Pitts. billet and bloom crops	19.00 to 19.50
Cleveland, billet and bloom crops	17.00 to 17.50

SHOVELING STEEL

Chicago	12.25 to 12.75
Pittsburgh	11.50 to 12.00
St. Louis	12.00 to 12.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	13.50 to 14.00
Eastern Pennsylvania	16.00 to 16.50
Pittsburgh	17.25 to 17.50
St. Louis	14.00 to 14.50

FROGS, SWITCHES, GUARDS

Chicago	13.75 to 14.00
St. Louis	13.50 to 14.00

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	14.25 to 14.75
St. Louis	11.75 to 12.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	10.00 to 10.50
Buffalo, No. 1	12.25 to 12.75
Buffalo, No. 2	14.25 to 14.75
Chicago, No. 1	12.00 to 12.60
Chicago, No. 2	12.25 to 12.75
Cincinnati, No. 1 (dealers)	11.00 to 11.50
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	15.50 to 16.00
New York, No. 1 (dealers)	11.00 to 11.50
Pittsburgh, No. 1	12.50 to 13.00
Pittsburgh, No. 2	15.50 to 16.00
St. Louis, No. 1	11.00 to 11.50
St. Louis, No. 2	12.00 to 12.50

WROUGHT PIPE

Boston (dealers)	7.50 to 8.00
Eastern Pennsylvania	11.50 to 12.50
Buffalo	12.00 to 12.50
New York (dealers)	8.75 to 9.25

YARD WROUGHT

Boston	8.50 to 9.00
Eastern Pennsylvania	15.00 to 15.50

BUSHELING

Buffalo	12.00 to 12.50
Chicago, No. 1	10.75 to 11.25
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	10.50 to 11.00
Cincinnati, No. 2	7.00 to 7.50
Pittsburgh, No. 1	12.00 to 12.50
St. Louis, No. 1	10.25 to 10.75

MACHINE SHOP TURNINGS

Birmingham	8.00 to 9.00
Boston	6.00 to 6.25
Buffalo	9.00 to 9.50
Chicago	7.50 to 8.00
Cincinnati (dealers)	8.50 to 9.00
Cleveland	9.00 to 9.25
Detroit	7.25 to 7.75
Eastern Pennsylvania	11.00
New York (dealers)	7.00 to 7.50
Pittsburgh	11.50 to 12.00
St. Louis	6.25 to 6.75

CAST IRON BORINGS

Birmingham (chemical)	13.00 to 13.50
Birmingham plain	8.00 to 9.00
Boston (chemical)	9.50 to 10.00
Boston (dealers)	6.50 to 7.50
Buffalo	10.00 to 10.50
Chicago	10.00 to 10.50
Cincinnati (dealers)	8.75 to 9.25
Cleveland	10.50 to 10.75
Detroit	8.75 to 9.25
Eastern Pennsylvania	11.00
Eastern Pennsylvania (chem.)	15.00 to 15.50
New York (dealers)	6.75 to 7.35
Pittsburgh	11.50 to 12.00
St. Louis	9.50 to 10.00
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	6.00 to 6.25
Buffalo	10.00 to 10.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	10.50 to 10.75
Detroit	8.75 to 9.25
Eastern Pennsylvania	10.00 to 11.00
New York (dealers)	6.75 to 7.35
Pittsburgh	11.50 to 12.00

PIPES AND FLUES

Chicago (net)	7.50 to 8.00
Cincinnati (dealers)	7.75 to 8.25
St. Louis	9.25 to 9.75

RAILROAD GRATE BARS

Buffalo	10.50 to 11.00
Chicago (net)	11.00 to 11.50
Cleveland	12.00 to 12.50
Eastern Pennsylvania	12.50
New York (dealers)	8.25 to 8.75
St. Louis	12.00 to 12.50

FORGE FLASHINGS

Boston (dealers)	6.00 to 6.50
Buffalo	11.00 to 11.50
Chicago	9.00 to 9.50
Cleveland (over 10 in.)	12.50 to 13.00
Detroit	9.50 to 10.00
Pittsburgh	13.50 to 14.00

FORGE SCRAP

Boston (dealers)	6.00 to 6.50
Chicago	14.00 to 14.50
Eastern Pennsylvania	10.50 to 11.00

ARCH BARS AND TRANSOMS

Chicago (net)	17.50 to 18.00
St. Louis	19.50 to 20.00

Iron and Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	8.00 to 8.50
Buffalo	13.50 to 14.00
Chicago	10.25 to 10.75
Cleveland	12.00 to 12.25
Eastern Pennsylvania	12.50 to 13.00
Pittsburgh	14.00 to 14.50
St. Louis	9.00 to 9.50

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	16.00 to 17.00
Buffalo	16.50 to 17.00
Chicago	17.90 to 18.50
Cleveland	16.00 to 16.50
Eastern Pennsylvania	21.00 to 22.00
Pittsburgh	18.50 to 19.00
St. Louis	19.50 to 20.00

SHAFTING

Boston (shipping point)	13.00 to 13.50
Chicago	16.80 to 17.35
Eastern Pennsylvania	17.50 to 18.00
New York (dealers)	14.00 to 14.50
St. Louis	16.00 to 16.50

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	14.00 to 15.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	13.75 to 14.25
Buffalo, steel	15.25 to 15.75
Chicago, iron	13.50 to 14.00
Chicago, rolled steel	15.00 to 15.50
Cincinnati	12.75 to 13.25
Eastern Pennsylvania	15.00 to 16.00
New York iron (dealers)	12.00
Pittsburgh, iron	14.75 to 15.25
Pittsburgh, steel	17.25 to 17.50
St. Louis, iron	13.50 to 14.00
St. Louis, steel	14.50 to 15.00

NO. 1 CAST SCRAP

Birmingham, cupola	14.00 to 14.50
Boston	14.50 to 15.50
Buffalo	14.00 to 14.50
Chicago, No. 1 machinery	15.70 to 16.25
Chicago, No. 1 railroad	14.00 to 14.55
Chicago No. 1 agricultural	14.00 to 14.55
Cincinnati No. 1 machinery cupola (net tons dealers)	14.50 to 15.00
Cleveland, cupola	16.50 to 17.00
Detroit (net tons)	12.50 to 13.00
Eastern Pennsylvania (cupola)	16.50 to 17.00
New York, cupola (dealers)	13.00 to 13.50
Pittsburgh, cupola	14.50 to 15.00
San Francisco, delivered	20.00 to 21.00
Seattle	15.50 to 15.75
St. Louis, railroad	13.50 to 14.00
St. Louis, agricultural	13.25 to 13.75
St. Louis, machinery	13.25 to 13.75
Valleys	16.50 to 17.00

HEAVY CAST

Boston	15.00 to 15.50
Buffalo (breakable)	11.50 to 12.00
Cleveland	12.50 to 12.75
Detroit (automobile) (net tons)	18.50 to 19.50
Eastern Pennsylvania	15.50 to 16.00
New York (dealers)	11.75 to 12.00
Pittsburgh	13.50 to 13.75

MALLEABLE

Boston, railroad	13.50 to 14.00
Buffalo	14.50 to 15.00
Chicago, agricultural	11.75 to 12.25
Chicago, railroad	12.50 to 13.00
Cincinnati, railroad (dealers)	12.00 to 12.50
Cincinnati, agricultural (dealers)	11.00 to 11.50
Cleveland, agricultural	15.00 to 15.50
Cleveland, railroad	15.50 to 16.00
Detroit, auto	13.00 to 13.50
Pittsburgh, railroad	14.50 to 15.00
St. Louis, agricultural	12.50 to 13.00
St. Louis, railroad	12.50 to 13.00

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	13.50 to 14.00
Boston (dealers)	10 00 to 10.50
Buffalo	14.25 to 14.75
Chicago	14.50 to 15.00
Eastern Pennsylvania	16.00
New York	11.00 to 12.00
Pittsburgh district	16.50 to 17.00
St. Louis	15.00 to 15.50

LOCOMOTIVE TIRES

Chicago, No. 1	14.00 to 14.50
Chicago, cut	14.50 to 15.00
St. Louis, No. 1	14.00 to 14.50

LOW PHOSPHORUS PUNCHINGS

Chicago	14.00 to 14.50
Pittsburgh	16.50 to 17.00

Scrap

Better Sentiment at Pittsburgh Helps Markets in Other Centers—Prices Stronger

AN END of the period of waiting for a movement in scrap seems near. Better conditions have followed increasing demand in the Pittsburgh district and other centers have responded. Small lot buying continues but the promise is for larger tonnages in another fortnight. Prices are higher in some centers and strong where advances have not appeared.

Chicago, Dec. 27.—Iron and steel scrap quotations continue strong despite the fact buying of heavy melting steel and other grades is in scattered lots. It is understood that several interests have been accumulating scrap tonnages for a sale that may be made soon. Heavy melting steel continues $12.25 to $12.75. Miscellaneous rails have advanced 25 cents and now are $13.75 to $14. No. 1 busheling is strong, due in part to restricted production of borings.

Boston, Dec. 27.—There is a generally better feeling in the scrap market, since the firming up of prices in the Pittsburgh district and the effort of brokers to cover contracts. The fact that scrap is not being offered freely in this district has interested brokers. There has been some shipping of scrap to Pennsylvania and Pittsburgh, but generally the movement out of New England has been small.

New York, Dec. 27.—Scrap trading reflects seasonal influences, with consuming demand slack and dealers' buying prices unchanged. However, with prospects of better buying after Jan. 1 and with better sentiment in important scrap centers, the tone of the local market is stronger. Dealers believe that in certain grades at least prices have hit bottom and should show an upward tendency shortly.

Philadelphia, Dec. 27.—Current business in iron and steel scrap involves only small lots. Improved sentiment in the Pittsburgh market has brought about a somewhat more confident feeling among dealers in this territory. Prices show no change here. The only new feature of interest is increased small trading due to efforts by brokers to pick up tonnage against contracts on which they are short.

Buffalo, Dec. 27.—An almost total suspension of shipments of scrap has been ordered in this district for this week but several melters will take heavy melting steel on contracts after Jan. 1. New business is lacking in all lines. Present consumption of specialties forecasts a dull January.

Pittsburgh, Dec. 27.—While the tendency has been growing to postpone scrap purchases until after the first of the year, a few quiet deals have been made wherein some high prices have ruled. One lot of heavy melting steel, about which details are withheld for the time being since shipments will start early in 1928, was at $16. Others paid $15.50. Two or three lots of steel specialties involved up to 1000 tons at a time and to obtain suitable material $17.50 was paid, following $17 and $17.25 recently ruling. A sale of iron car wheels brought $15.25, whereas $15 was the preceding top. Cast iron borings are up 50 cents, and axle turnings likewise, small lots being obtained at $14.50. No. 1 wrought is up $1 to $12.50 to $13.

Detroit, Dec. 27.—Expectation of good first quarter business is keeping iron and steel scrap firm. Current demand continues small. Inquiries are being received in good number. Dealers are maintaining prices and some increase in quotations is looked for within the next 15 days. Current prices are steady and unchanged.

Cleveland, Dec. 27.—Sentiment in iron and steel scrap continues to improve, though melters are not purchasing more heavily than in recent weeks. Dealers are paying $13.75 and $13.25 for No. 1 and No. 2 heavy melting steel, respectively, in small lots and 25 cents higher for 1000 tons or more. Steelworks scrap is stronger than foundry grades. More scrap is coming out than dealers can ship. Those melters taking in scrap are regulating shipments.

St. Louis, Dec. 27.—Iron and steel scrap shows greater strength, due to enthusiasm of dealers. Consumers have increased their purchasing to some extent, but not in heavy tonnages. It is evident melters need scrap, and while resisting higher prices, have been obliged to meet quotations for what they have bought.

Birmingham, Ala., Dec. 27.—Iron and steel scrap is quiet but indications point to an early revival. Resumption of operations as well as starting up of the cast iron pipe shops will bring about need for larger quantities of heavy melting steel and No. 1 cast.

Toronto, Ont., Dec. 27.—Canadian iron and steel scrap markets have not yet reflected improved sentiment of the American markets. Consumers in Ontario are taking small tonnages for immediate shipment but refuse to stock. At Montreal stronger demand for export is noted. Prices, generally, are unchanged at Toronto and Montreal.

Sheets

Market Shows More Activity, with Motorcar Industry Taking Larger Tonnages

SHEETMAKERS are more encouraged over the outlook, as some consuming lines are showing increased requirements. The automotive industry and car builders and repairers are placing larger orders and specifying more liberally, while other lines also reflect fair activity. Prices still show a considerable range. Some mills have covered autobody requirements for first quarter at 4.00c.

SHEET PRICES, PAGE 1622

Pittsburgh, Dec. 27.—Despite disinclination to add to stocks at the inventory season, users of sheets have been actively specifying against contracts and ordering in fair size lots for early January fabrication. A number of makers will require some time to work out from under low-price business. A few have sidestepped long-time bookings wherever possible. With the return of the automobile industry to a tonnage consuming basis and car building and repairing back on the active list, every line using sheets appears at least normally busy for this season. Some attractive orders have been placed for car roofs. While the building trades have fallen behind in some sections in taking metal lath and other grades, demand in other directions shows improvement. Electrical sheets are a little slower. Prices below 2.75c in the spot market on black have some special circumstances surrounding them; usually 2.80c is wanted for immediate shipment and 2.90c is held for first quarter. Some galvanized sheets recently went as low as 3.60c in the spot market although some makers will not now go below 3.65c and all ask 3.75c for first quarter. Practically everybody quotes 2.10c on blue annealed for first quarter, with the 10-cent extra for material 40 inches or wider. The full finished price is 4.00c and some makers have covered their customers for the entire quarter. Others have an asking price of 4.15c which may be realized as a market price before the first quarter is out. While independent operations are reported to be around 75 per cent for the first half of the week, the American Sheet & Tin Plate Co. has

not managed to get up that high. It now is on a 65 per cent basis.

New York, Dec. 27.—All makers continue to quote the new prices on sheets, but there continues a lack of tests of these prices. Consumers and jobbers generally were given a chance to place their requirements up to the end of the first quarter at the old prices; hence, most requirements at this time are coming in at the old figures and there has been little necessity so far for buyers to pay the new prices. Specifications are fair.

Buffalo, Dec. 27.—A former 2.70c, Pittsburgh, quotation on black sheets has disappeared. A few sellers continue to book at 2.80c but more ask 2.90c. Some good size first quarter inquiry is scheduled for quick covering in this district and elsewhere, including some desirable full finished business.

Youngstown, O., Dec. 27.—Expecting much better rates of mill operations when they resume on Jan. 3, four independent sheetmakers in this district have closed this week for repairs. Anticipation of the broadening in mill activities shortly after Jan. 1 was heightened this morning by the receipt of a large volume of new orders and specifications by all important sheet mills in this district. Especially notable is the receipt of a greater volume of business from automotive body builders now engaged on making closed jobs for the new line of Chevrolets planned for January. This morning 55 per cent of independent sheet capacity in the district is active against 75 per cent active last week. This morning's mail brought to valley mills continued encouragement in the larger volume of both new orders and specifications for all grades of sheets. Less sales resistance is being encountered on the part of regular customers to the new base of 2.90c for common black.

Cincinnati, Dec. 27.—Local offices of nearby sheet manufacturers report business in December has been fairly good and prices are firm. These prices are 3.75c, Pittsburgh, for galvanized sheets, 2.10c for blue annealed and 2.90c for one-pass black sheets.

St. Louis, Dec. 27.—Producers and distributors of sheets report demand up to expectations, season considered. Prices are steady on virtually all grades. Specifications have dropped slightly, which is ascribed to the inventory period. Galvanized material is moving in good volume to the South, and generally to agricultural areas.

Chicago, Dec. 27.—Sheet mill operations are unchanged at 65 to 70 per cent for the district. Two-day shutdowns were scheduled in the district over the Christmas and New Year holidays. First quarter business is being booked at the recently advanced prices. It is understood that one producer placed an order for 600 tons of wide blue annealed sheets at 2.30c, mill. Chicago delivered prices for No. 24 black sheets are 2.95c to 3.05c; No. 24 galvanized sheets, 3 80c to 3.90c; and No. 10 blue annealed sheets 2.25c to 2.35c.

Philadelphia, Dec. 27.—Sheet demand shows some improvement, based largely on consumption. A large part of the consuming trade is now under contract through the first quarter at the old prices, and hence has no incentive to lay in stocks.

Cleveland, Dec. 27.—Demand from sheet steel consumers has been far better than expected by producers. The smallness of stocks, necessitating shipments immediately following inventory, and the desire to take out all fourth quarter contract tonnage at advantageous prices has made specifications sufficiently heavy in the past week to step production of some mills up to 100 per cent. The new prices still are to be tested. Most first quarter contracts were made at 2.80c, Pittsburgh, or under, and 2.90c has not had much test even on spot business. Blue annealed is quotable at 2.10c with most makers holding to the 10-cent extra for over 40-inch width, although little spot business is up to be so quoted. Autobody continues shipped against 4.00c contracts with 4.15c the price for new business.

Tin Plate

Specifications Keeping Mills Busy—Price Is Steady

TIN PLATE PRICES, PAGE 1622

Pittsburgh, Dec. 27.—Arrangements between tin plate producers and large container manufacturers whereby the latter furnish specifications anticipating their requirements, to give the mills good rolling schedules at a time of the year which ordinarily would be quiet, are again working out to their mutual advantage. Unless all signs fail, 1928 will more than make up for 1927 deficiency in consumption, which was 10 or 15 per cent under 1926. In some directions, particularly among northwest fish packers, many cans are being carried over and this may serve as a deterrent. The open market price of $5.25 is better observed than its predecessor. Average operations are reported to be around 70 per cent.

Pipe

Valley Mill Books 30,000-Ton Line—Cast Market Slackens Temporarily

CLOSING of 30,000 tons of pipe for a 150-mile, 8-inch line, to the Youngstown Sheet & Tube Co. featured tubular product buying of the past week. Jobbers generally are postponing orders until after inventories. Although temporarily duller than in preceding weeks, the cast iron pipe market includes 5000 tons on inquiry at Milwaukee and 2825 tons at Portland, Oreg.

PIPE PRICES, PAGE 1622 AND 1652

Pittsburgh, Dec. 27.—End-of-the-year lulls are encountered by pipe producers. Rumors are being circulated about gas and oil lines, but many of these are in the preliminary stages. Pipemakers are confident these will materialize early in 1928. For instance, the survey is not yet complete upon the site for the 10-inch line of Transcontinental Oil Co. This probably will be 170 miles instead of 400 miles, as originally outlined. The Empire Gas & Fuel Co.'s extension referred to before as a pending inquiry, is said to have been laid last spring. Jobbers only aim at keeping fair sized stocks. Some of these are not evenly balanced, but will be brought into line shortly after Jan. 1. The price situation on pipe products still presents exceedingly keen competition.

Youngstown Sheet & Tube Co. has booked an order for 150 miles of 8-inch pipe involving about 30,000 tons of steel.

Sinclair Pipe Line Co. will build an additional 8-inch line between Mexia, Tex., and Healdton, Okla., 150 miles, increasing capacity of its main line to a minimum of 30,000 barrels daily between Oklahoma and Houston, Tex., according to recent announcement. The cost will be about $2,000,000.

Boston, Dec. 27.—The opening of bids for the 1800 tons of pipe for Boston, Dec. 21, found a French interest as low bidder, while the Warren Foundry & Pipe Co. was the low American bidder. The award will not be made for some time. Private business continues in good volume and is expected to show an expansion after the turn of the year. Among the tonnages anticipated is the closing of some 3000 tons by a New England utility interest.

Chicago, Dec. 27.—Cast iron water pipe producers have closed down generally over the inventory and holiday periods. Several heavy tonnages are expected to be closed in the Middle West for municipal work shortly after Jan. 1. Producers have a fair amount of business on their books for January. The price for 6 to 24-inch is nominal $28 to $30, Birmingham.

Birmingham, Ala., Dec. 27.—Resumption of operations at cast iron pipe shops will take place Jan. 3. Unfilled tonnage and new business in sight warrants belief that steady production will be seen for some time

ahead. Quotations are given at $29 to $30 on 6-inch and over sizes, although concessions have been rumored again lately.

CONTRACTS PLACED

600 tons, 6 to 12-inch, for New Britain, Conn., to Warren Foundry & Pipe Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

5000 tons; 100 tons of 6-inch, 1500 tons of 8-inch, 1500 tons of 12-inch, and 1000 of 16-inch class C water pipe, and 300 tons of special castings; Milwaukee; bids in Jan. 9.

4200 tons, 6 to 12-inch water pipe for Massapequa, Long Islandfi N. Y.; general contractors' mids close Dec. 27.

3000 tons, New England Utility interest, Boston.

2825 tons, 6 to 24-inch class B, Portland, Oreg.; bids in Jan. 5.

2600 tons, water department, New York; bids in Jan. 9. Previously noted pending with bids opened Dec. 20.

2800 tons, Portland, Oreg.; bids in Jan. 6.

1856 tons, 6 and 8-inch class C, Los Angeles; B. Nicoll & Co. low bidders.

1800 tons, Boston; bids being taken.

373 tons, 2 to 10-inch class B, Nogales, Ariz.; bids in Jan. 5.

340 tons, 4 to 8-inch class B for Ravenswood Winona avenue, San Diego, Calif., general contract to E. W. Redman.

231 tons, 6 to 12-inch class B, Santa Ana, Calif.; bids opened.

188 tons, 4 to 8-inch class B, Belmont, Calif.; bids in Jan. 9.

135 tons, 6-inch class B, improvement in Winona avenue, San Diego, Calif.; George R. Daly, low bidder on general contract.

135 tons, 6-inch class B, improvement of Winona avenne, San Diege, Calif., general contract to V. R. Dennis Construction Co.

129 tons, 6 and 10-inch class B, Eureka, Calif.; bids in Jan. 3.

100 tons, sewage disposal plant, Jamestown, N. Y.; bids to be asked soon.

Unstated tonnage, 8 to 12-inch, the Dalles, Oreg.; $35,000 appropriated.

Refractories

Hopes High For Early 1928 Despite Present Lull

REFRACTORIES PRICES, PAGE 1649

Pittsburgh, Dec. 27.—Refractory makers, especially fire clay brick producers, are in a dull period. One plant has been down entirely for two months. Others are operating 40 or 50 per cent. Brick consumers are not taking advantage of the year-end lull to make ordinary repairs. Apparently all are deferring action on purchases until after inventories are completed. All brick makers are sanguine over prospects for early 1928. Prices in the meantime are firmly held. Chrome and magnesite brick customers are now practically all under cover with contracts at unchanged prices.

In 1896 practically the first record of the use of vanadium in steel is offered. Three armor plates were at the Firming steelworks in France in which this element was used.

Bars

Users Specify Heavily Against Contracts—Forward Buying Is Moderate—Consumption Up

CHICAGO mills have sufficiently heavy bar specifications to delay deliveries somewhat, a condition which has been lacking for some time. At Pittsburgh most consumers are covered for first quarter, with heavy specifications on low-priced contracts. A higher quotation is expected to appear soon. Preferential discounts are being discarded.

BAR PRICES, PAGE 1622

Chicago, Dec. 27.—Deliveries of bar mill products, as in other lines of finished steel, have been extended moderately. While shipments are not greatly deferred it is becoming more difficult for mills to schedule odd lots that do not match rollings. First quarter contracting for bar products is making a steady gain. Most buyers express confidence in the outlook. One producer expects fully as good business as in the first quarter of 1927. Buyers generally have taken advantage of their opportunity to specify fully on fourth quarter obligations. Farm implement demand is one of the strongest features in the market. No slump has been shown by the implement makers in the past 60 days and it is probable December specifications may show an increase over November.

Rail steel bar shipments are at a high rate. An important share of current business is from the farm districts. Rail steel bars are 1.80c to 1.85c, Chicago Heights, with more firmness. Bar iron, more active than for some weeks, is firm at 1.90c, Chicago.

Contracting for soft steel bars is on the basis of 1.90c, Chicago. At least one producer is making a rigid price of 2.00c for lots of under 100 tons.

New York, Dec. 27.—Specifications on fourth quarter steel bar contracts continue good, consumers and jobbers generally taking advantage of contract prices which expire Dec. 31. Mills in most cases refuse to promise shipping dates, although in some cases it is stipulated that no bars will be shipped after Jan. 31 at less than 1.80c, base, Pittsburgh. In the meantime the price on all new business continues firm at 1.80c, base, Pittsburgh, and an impressive feature is the extent to which differentials under the market price are being eliminated. So-called preferential consumers who have enjoyed such differentials for years have been assured that these preferences would be discontinued with the end of the year.

Philadelphia, Dec. 27.—Steel bar demand is exceptionally good, consumers and jobbers rushing specifications to take advantage of prices that expire Dec. 31. Demand mainly is on account of a desire to build up stocks, but consumption also is reported better.

Pittsburgh, Dec. 27.—Merchant steel bar makers have received heavy specifications throughout December on low priced contracts. Cold bar finishers, enjoying improved demand from the automotive industry, have been liberal with orders. Other consuming lines are sharing in improved business, but their bar buying has been light. Jobbers, however, have added to stocks. Customers are well covered for first quarter at 1.80c because from all appearances a higher level by at least $1 per ton will shortly be inaugurated. It remains to be seen to what extent the present month's specifications will interfere with shipping instructions in January, but the general belief is that tonnage now being asked is for actual consumption and that January specifications will come in due course. Barmaking continues at about 60 per cent. The new bar card of Dec. 15 is being generally adopted.

Cleveland, Dec. 27.—Orders for steel bars booked by some sellers in December have doubled the November total and made the month easily the best of the last half. Not all of this material will be shipped, however, by the end of the month. Consumption shows slight indications of increasing. The year-end decline in activity is milder than usual. Bars are held at 1.80c, Pittsburgh or Cleveland.

Detroit, Dec. 27.—Bar demand has shown considerable improvement over that for November, due to many consumers specifying material under old contracts.

Canadian Iron Output Off but Steel Gains

Toronto, Ont., Dec. 27.—Production of pig iron in Canada in November totaled 37,989 long tons, compared with 38,097 tons in October and 52,345 tons last November. Nova Scotia led in production. In the 11 months ending with November, pig iron production in Canada has totaled 646,500 long tons, a decline of 5 per cent from a year ago. One blast furnace was put on last month, making four active on November 30.

Steel ingot and castings output in Canada in November was 80,730 long tons compared with 56,371 tons in October and 54,311 tons last November. The 11-month total for 1927 stands at 811,390 tons, against 718,395 tons in 1926.

Structural Shapes

Large Tonnage Lots Continue to be Booked by Fabricators but Small Projects Decrease —Mills Receiving Better Specifications

IN A season of comparative inactivity, structural steel fabricators have found demand holding at a high level. Although the number of small lot contracts has lessened during the past week, heavy tonnages continue to be booked. Leading awards of the week included 7000 tons for additional bridgework of the Union Terminals project in Cleveland and 5000 tons for James river bridgework in Virginia. Inquiries for large projects were fewer during the week, but included such jobs as the 14,000-ton store and office building in Boston and an 8000-ton bridge at Longview, Wash.

Efforts of consumers to take out all low price contract tonnage before Jan. 1 have contributed to heavy specifications received by mills during the week. First quarter contracting is active.

STRUCTURAL SHAPE PRICES, PAGE 1622

Chicago, Dec. 27.—About 2000 to 2500 tons of new structural inquiry has appeared, although awards are light. The 13,000 to 14,000-ton Daily News building, Chicago, is ready to be closed, steel bids having been received some time ago. A new pumping station for the north side of Chicago is to be erected at a cost of $2,149,000. The general contract for this project already has been let. Fabricating shops are getting a fair amount of small-lot business which has been maintained at a steady pace. Specifications from the car builders thus far have been light. Fabricators are contracting for first quarter on the basis of 1.90c, Chicago.

Boston, Dec. 27.—Few awards were made in the structural market during the past week. The largest prospect for some time is the new office and store building to be erected on St. James street, in the Park Square section, which calls for 14,000 tons.

Philadelphia, Dec. 27.—Carnegie Steel Co. recently booked 5000 tons of 30-inch I-beams from the Turner Construction Co., to be used in the trestle work of the bridge across the James river, between Newport News and Norfolk, Va. The fabricating, which comprises merely the drilling of holes in the beams, will be done by the contractor.

Pittsburgh, Dec. 27.—Awards of structural shapes are slim, as is usual at this season when the tendency is strong to defer action until after the holidays. Inquiries keep up well but the average tonnage involved is small. One shop took 225 tons throughout the week but this was made up of six or seven jobs. Purchases at Philadelphia for the Baltimore & Ohio railroad will take 1000 tons, and local bidders are interested. Specifications coming to the mills of late have been active on low priced contracts. No specifications have appeared yet against first quarter arrangements at 1.80c.

Philadelphia, Dec. 27.—Shape demand is heavy. Consumers and jobbers are taking advantage of old prices to lay in stocks. The price situation is not entirely clear. Some makers are quoting 1.75c, Pittsburgh, or 2.07c, Philadelphia, whereas the 1.95c Bethlehem price is 2.08c, Philadelphia. No real test is expected until next month.

Cleveland, Dec. 27.—Awarding of 7000 tons for additional work on the Prospect street bridge of the Cleveland Union Terminals Co. project featured the structural market here. Plain material specifications are coming to mills from consumers taking advantage of fourth quarter contracts to take all covered tonnage at the old prices. On spot and first quarter business 1.80c, Pittsburgh, is firm.

Awards Compared

	Tons
Awards this week	25,215
Awards last week	36,275
Awards two weeks ago	34,850
Awards this week in 1926	33,340
Average weekly awards, Nov.	23,243
Average weekly awards, 1927	35,346
Total awards to date, 1926	1,496,248
Total awards to date, 1927	1,827,903

CONTRACTS PLACED

7000 tons, additional tonnage for Prospect street bridge, Union Terminals project, Cleveland, to Mt. Vernon Bridge Co.

5000 tons, 30-inch I-beams for trestle work of James river bridge between Newport News and Norfolk, Va., to Carnegie Steel Co., through the contractor, Turner Construction Co.

2500 tons, factory for Firestone Tire & Rubber Co. at Los Angeles, to Llewellyn Iron Works.

2400 tons, Sterling Library, Yale university, New Haven, Conn., to Levering & Garrigues Co.

1500 tons, apartment in Philadelphia, to Bethlehem Steel Co.

1200 tons, Babies hospital, Columbia Presbyterian Medical center, New York, to unstated fabricator.

800 tons, bridge for Western Pacific railroad, San Francisco, to United States Steel Products Co.

700 tons, building for Gypsum Corp., Linden, N. J., to Belmont Iron Works.

615 tons, Beaver river bridge, Wampum, Pa., through J. M. McMahon, general contractor, to Pittsburgh Bridge & Iron Co.

600 tons, apartment, Union and Leavenworth streets, San Francisco, to Pacific Coast Engineering Co.

500 tons, bridge, Providence, R. I., to McClintic-Marshall Co.

500 tons, Broad Street Trust Co. building, Philadelphia, to unstated local fabricator.

450 tons, Boston & Maine railroad bridges, Lawrence, Mass., previously noted placed, went to Boston Bridge Works.

350 tons, 250-foot logging railroad bridge for Hammond Lumber Co. at Foss, Oreg.; to Wallace Bridge & Structural Steel Co.

300 tons, Jordan Marsh Co. warehouse Cambridge, Mass., to New England Structural Co.

225 tons, six or seven miscellaneous awards in Pittsburgh district, to the Fort Pitt Bridge Works.

200 tons, office building for Boston, to New England Structural Co.

200 tons, scattered business in Pittsburgh area, to Pittsburgh Bridge & Iron Works.

180 tons, Sells department store, Johnson City, Tenn., to Johnson City Foundry & Machine Co.

175 tons, office building and stores, Newbury street, Boston, to New England Structural Co.

150 tons, garage, Davidson county highway commissioners, Nashville, Tenn., through Foster & Creighton, that city, general contractors, to International Steel & Iron Co.

120 tons, Deaconess hospital, Cleveland, to Wellman-Seaver-Morgan Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

14,000 tons, office building and stores, St. James street, in Park Square section, Boston.

8000 tons, bridge, Longview, Wash.; bids within 90 days.

2500 tons, office and state capital building, Harrisburg, Pa.; previously noted as unstated tonnage.

2200 tons, 27-story Northern Life Insurance building, Seattle; bids in.

2100 tons, two bridges for Simpson Logging Co., Shelton, Wash.; bids in.

1400 tons, Lincoln high school, Milwaukee; A. F. Wagner Archutectural Iron Works, Milwaukee, low bidder.

1000 tons, bridges for Baltimore & Ohio railroad, Philadelphia; bids close Dec. 30.

1000 tons, telephone building, Washington.

800 tons, office building, Honolulu, Hawaii, for Alexander & Baldwin; bids in Jan. 14.

750 tons, Y. W. C. A., Cincinnati; general contract to Hodges Construction Co.

700 tons, Argo viaduct, Seattle; general contract to J. A. McEachren Construction Co., Seattle; bids in.

600 tons, building at Cristobal, Canal Zone, for Panama Canal; bids in Dec. 28.

600 tons, church, Wilshire and Hobart boulevards, Los Angeles; bids opened.

500 tons, bridges for Vermont.

500 tons, viaduct for Denver & Salt Lake railroad at Wolcott, Colo.; bids being received.

400 tons, Hunter bridge at LaCrosse, Wis.; bids close Jan 5.

400 tons, ice plant for Pacific Fruit Express Co., Fresno, Calif.; bids opened.

400 tons, Women's Athletic club, Oakland, Calif.; Herrick Iron Works low bidder.

350 tons, F. W. Woolworth Co. building, Church and Vesey streets, New York; previously reported as unstated tonnage.

300 tons, parochial school, Brooklyn, N. Y.

250 tons, bridges for Chesapeake & Ohio railroad.

Unstated tonnage, junior high school, West Orange, N. J.

Concrete Bars

Heavy Buying Carried on in Usually Dull Season—Prices Stiffening

DESPITE the usual dullness of the season contracting ahead by large interests continues undiminished. New York district furnishes the feature award, with a 3500-ton letting for the United States appraisers building, New York, and 2100 tons for two bridges. A San Francisco bridge taking 8500 tons heads the inquiry list. Buffalo sellers have adopted a Buffalo base.

REINFORCING BAR PRICES, PAGE 1622

Pittsburgh, Dec. 27.—Concrete bars in small lots are active, but closing of larger jobs is postponed. The Baltimore & Ohio railroad's warehouse is delayed again. Instead of 1000 tons, as originally reported, the Grant building basement will only require about 150 tons. Concrete bars are 1.80c to 1.90c, and some protections for work running into March and April next year carry the latter figure, even though the quantities involved include tonnages attractive from a rolling standpoint.

Boston, Dec. 27.—While a number of large propositions are in the making, little is being closed in the concrete bar line. The award of 450 tons for a new bridge at Bristol, R. I., to the Foundation Co. was the largest of the week.

Buffalo, Dec. 27.—A new base price of 1.90c, Buffalo, is being quoted on reinforcing bars to be shipped direct from steelworks. This represents a net saving to district consumers of about $3 a ton when compared with the previous low quotation of 1.80c, Pittsburgh. On lots shipped from producers' warehouses the price is now about 2.40c, delivered, Buffalo. A 1500-ton inquiry for a new grain elevator here is expected to be covered soon. Operations of mills has been cut sharply.

Cleveland, Dec. 27.—Buying of concrete bars from jobbers is slow and fabricators are delaying releases from mills until inventories are completed. Several large concrete bar projects are in prospect, but the only one of size to be closed in the week involves 1300 tons of rail steel for a sewage job at Dayton. New billet bars are firm at 1.80c, Cleveland mill or Pittsburgh, with stock prices quoted 2.20c, Cleveland and 2.30c, Youngstown, for attractive orders.

Detroit, Dec. 27.—Little improvement is noted in demand for concrete bars. Small lot buying has featured activities this month but aggregate tonnage involved has been slightly ahead of that for November. The expectation of fair first quarter business is keeping the market firm. New billet bars are fairly steady at 1.80c, Pittsburgh, or 1.90c, Buffalo.

Chicago, Dec. 27.—Reinforcing bar fabricating shops in this district are about 65 per cent engaged. December shipments are well up to the average for the similar month in previous years. A lull in awards has followed the recent spirited activity. Billet bars are quoted more generally at 2.20c to 2.75c. Rail steel reinforcing bars are 1.80c to 1.90c, the 1.80c price applying only on attractive orders.

Cincinnati, Dec. 27.—Bookings of concrete bars for the opening of the year are heavier than was expected earlier in the month and prices are firmer.

Awards Compared

	Tons
Awards this week	9,115
Awards last week	8,430
Awards two weeks ago	7,759
Awards this week in 1926	4,845
Average weekly awards Nov.	8,074
Average weekly awards, 1927	5,727
Total awards to date, 1926	323,338
Total awards to date, 1927	301,194

CONTRACTS PLACED

3500 tons, United States Appraisers Stores building, New York, to Jones & Laughlin Steel Corp., through Turner Construction Co.
1300 tons, rail steel, sewage disposal plant, Dayton, O., through E. H. Latham Co., Columbus, O., general contractor, to Pollak Steel Co.
1200 tons, deck for bridge between Perth Amboy, N. J., and Tottenville, Staten Island, New York, to Edward T. Edwards, through P. J. Carlin Construction Co.
900 tons, deck for bridge between Elizabeth, N. J., and Howland Hook, Staten Island, New York, to Edward T. Edwards, through Albert A. Volk, Inc.
600 tons, grain elevator for Chicago & North Western railroad at Council Bluffs, Iowa, to unstated fabricator.
450 tons, bridge at Bristol, R. I., to Foundation Co.
200 tons, Purcell high school, Cincinnati, to Pollak Steel Co.
200 tons, rail steel for Artificial Stone Co., Chicago, to Inland Steel Co.
150 tons, warehouse for Jordan Marsh Co., Cambridge Mass., to Concrete Steel Co.
150 tons, road work in Butler county, Pennsylvania, to Truscon Steel Co.
140 tons, city hall, San Pedro, Calif., to Los Angeles Iron & Steel Co.
125 tons, sewage pumping plant, Toledo, O., through A. Bentley & Son Co., that city, general contractor, to Bourne-Fuller Co.
100 tons, rail steel, Stritas school, 2731 West Sixty-second street, Chicago, to Calumet Steel Co.
100 tons, Women's Athletic club, Oakland, Cal., to Frederick Steel Co.

CONTRACTS PENDING

New Inquiry and Developments on Projects Previously Reported

8500 tons, Coyote Point bridge, San Francisco; award to be made next week.
1500 tons, Hecker-Jones-Jewell Milling Co. elevator, Buffalo; James Stewart & Co., Chicago, contractors.
1000 tons, building for Campbell Soup Co., Chicago.
750 tons, United States Veterans hospital, Portland, Oreg.; bids in Dec. 29.
600 to 1000 tons, Pacific Fruit Express building, Fresno, Calif.; bids in.
500 tons, Diablo dam project, Seattle; general contract to Winston Bros., Minneapolis.
450 tons, Kelley High school building, Chicago; general contract awarded unstated builder.
200 tons, first unit, Whitehouse railroad grade crossing, Cuyahoga county, O.; bids being taken by county commissioners, court house, Cleveland.
180 tons, garage, Fifth and Virginia streets, Seattle; bids in.
150 tons, basement for Grant building, Pittsburgh; bids closed Dec. 23.
150 to 200 tons, Cleveland Packard Co. sales and service building, Cleveland; bids in Jan. 5.
130 tons, garage in Federal street, Chicago; B-W Construction Co., general contractor.
110 tons, Queen Anne high school addition, Seattle; bids in.
100 tons, extension to Boulevard of the Allies, Pittsburgh; general contract let to M. O'Herron Co.
Unstated tonnage, 27-story North Life Insurance building, Seattle; bids in.
Unstated tonnage, warehouse for Baltimore & Ohio railroad, Pittsburgh; action postponed.
Unstated tonnage, Union Bag Co. plant, Tacoma, Wash.; general contract to Albertson, Cornell Bros. & Walsh.

Federal Trade Body Is Revising Rules

Washington, Dec. 27.—The federal trade commission has adopted a new rule of practice providing for insertion in every order to cease and desist the specific number of days in which the respondent must file a report in writing to say he has complied with the order, and reopening of cases by the commission within 90 days after disposition of such cases in instances where the commission so elects.

Coke Production Falls

By-product coke production in November is estimated at 3,500,000 net tons or 5.7 per cent under the 3,713,000 tons of October, according to the bureau of mines. Beehive coke output in November is estimated at 379,000 tons against 419,000 tons in October. This gives a combined coke total of 3,879,000 tons for November compared with 4,132,000 tons in October.

Kalman Buys Lath Maker

Chicago, Dec. 27.—Kalman Steel Co. has taken over the Sykes Metal Lath & Roofing Co., Niles, O., one of the oldest metal lath manufacturing companies in the country.

Empire Steel Co., Cleveland recently completed the installation of a new pickling house and a new boiler plant.

Rails, Cars

Brisk Car Buying Restores Confidence in Equipment—Track Accessories Active

CLOSING of contracts during the past week on 11,300 freight cars has had a stimulating effect upon the equipment market. Prospective buying programs aggregate 15,000 to 20,000 cars. Southern closed on 4500, Santa Fe on 3650, Louisville & Nashville on 2150 and Chicago & North Western 1000. Track accessory activity includes a 300,000-tie plate order by New York Central.

RAILROAD TRACK MATERIAL PRICES, PAGE 1622

New York, Dec. 27.—Heavy buying featured the car market during the past week, more than 11,000 cars being placed. This makes the heaviest week of car contracting since 1924. The market was featured further by reports of additional large lists under active contemplation. Chesapeake & Ohio is expected in the market shortly for a miscellaneous number of freight cars, which may reach 8000 to 10,000 cars, according to reports, and the St. Louis-San Francisco, for 4000 to 5000 cars, in addition to 20 coaches now actively pending. Pacific Fruit Express also is expected out shortly for 2000 refrigerator cars.

New York Central lines purchased about $3,000,000 worth of tie plates, spikes and track bolts to be delivered over the first six months in 1928. The business was distributed among Bethlehem Steel Co., Carnegie Steel Co., Jones & Laughlin Steel Corp., Illinois Steel Co., Inland Steel Co., and Bourne-Fuller Co. These lines will open bids here Jan. 3 on first quarter requirements. The inquiries call for a maximum of 350 tons of black, blue annealed and galvanized sheets, not to exceed 20,000 seamless boiler tubes, a maximum of 2000 axles, 250 tons of nails and wires, 2000 tons of bars, plates and shapes, 300 tons of billets and a considerable quantity of conduit and signal pipe.

Philadelphia, Dec. 27.—Pennsylvania railroad is expected to inquire this week for tonnage requirements of plates, shapes and bars and miscellaneous needs. Seaboard Air Line has revised its inquiry for 30 locomotives.

Pittsburgh, Dec. 27.—One local manufacturer of spikes and tie plates has been assured of sharing in the New York Central railroad's tie plate order to the extent of at least 300,000 plates. This road's spike order likewise has been divided, another local producer sharing the order with western mills. Nothing has been heard from either the Baltimore & Ohio or the Erie. The Pennsylvania pursues its policy of buying in small lots as needed. It recently placed 30,000 plates locally. Spike prices remain firm at 2.80c and tie plates at 2.25c, no concessions recently being uncovered.

Light rail orders are meager, in keeping with restricted coal mine operations. An occasional carload is booked at $36, and while coal output keeps up above 9,000,000 tons weekly, the extensions to coal workings do not justify extensive track purchases.

Cleveland, Dec. 27.—Wheeling & Lake Erie has placed with a Pittsburgh mill the angle plates to accompany its recent 5500-ton rail order.

Chicago, Dec. 27.—Long expected activity in the railroad equipment market has arrived, with the largest letting in many months being closed by the Atchison, Topeka & Santa Fe, involving 3650 cars. In addition to this letting, the allocation of which is listed under "Car Orders Placed" on this page, Chicago & North Western added 1000 to its recent awards. Louisville & Nashville has closed on 2150 freight cars.

Prospective car buying would indicate a resumption of activity in the equipment field. St. Louis-San Francisco is expected to close on 4000 to 5000 cars and the Chicago, Rock Island & Pacific for 1200 miscellaneous cars.

Two western railroads have fresh inquiry for an aggregate of 20,000 tons of standard steel rails in this market. Miscellaneous lots of light rails are being sold, this business being slightly heavier than a year ago. Rail rolling schedules were advanced further this week and now are slightly above 75 per cent for the district.

Sales of track fastenings during the week amounted to 10,000 to 12,000 tons. Inquiry is considerably heavier at 30,000 to 35,000 tons.

Illinois Central has placed orders for 50,000 tons of rails at a total cost of approximately $2,000,000. Distribution of the order is understood to be among the Illinois Steel Co., Inland Steel Co. and Tennessee Coal, Iron & Railroad Co.

CAR ORDERS PLACED

Atchison, Topeka & Santa Fe, 3650 cars, 750 stock cars to Pennsylvania Car Co.; 500 gondola and 300 flat cars to American Car & Foundry Co.; 500 refrigerator and 500 box to Pullman Car & Mfg. Corp.; 500 automobile cars to General-American Tank Car Corp.; 500 box cars to Mt. Vernon Car & Mfg. Co, and 100 ballast cars to Rodgers Ballast Car Co. Original inquiry for 3850 indicates 200 still pending.

Chicago & Eastern Illinois, two smoking and mail cars, to Pullman Car & Mfg. Corp.

Chicago & North Western, 1000 cars, 500 70-ton hoppers to Pullman Car & Mfg. Corp.; and 500 50-ton flat cars to American Car & Foundry Co.

City of Seattle, Skagit railway, one combination passenger and baggage, gasoline rail motor car, to the J. G. Brill Co.

Gulf, Mobile & Northern, 12 dump cars, to Koppel Industrial Car & Equipment Co.

Lehigh Coal & Navigation Co., four dump cars, to Clark Car Co.

Louisville & Nashville, 2150 freight cars, 1250 gondolas going to the Pressed Steel Car Co. and 300 box, 200 stock, 200 auto and 200 low side gondolas going to the Mt. Vernon Car & Mfg. Co.

Luzerne County Gas & Electric Co., one dump car, to Clark Car Co.

Maryland Slag Co., two dump cars, to Clark Car Co.

Metal & Thermit Corp., one tank car, to General-American Tank Car Corp.

Southern, 4500 cars, 2000 hoppers, to Standard Steel Car Co., 1750 automobile box cars to American Car & Foundry Co. and 750 hoppers to Mt. Vernon Car & Mfg. Co.; 25 passenger cars also to Bethlehem Steel Co.

Timken Roller Bearing Co., two dump cars, to Clark Car Co.

Warner-Quinlan Co., New York, 15 insulated tank cars, to American Car & Foundry Co.

LOCOMOTIVE ORDERS PLACED

Southern, 68 locomotives, reported placed as follows; 55 Mikado, five Pacific and eight Mallett-type, all to Baldwin Locomotive Works.

CAR ORDERS PENDING

New Inquiry and Developments on Projects Previously Reported

Chesapeake & Ohio, large but unstated number of miscellaneous freight cars, contemplated.

Northern Pacific, 50 caboose underframes.

Pacific Fruit Express Co., 2000 refrigerator cars; actively contemplated.

St. Louis-San Francisco, 4000 to 5000 freight cars, reported contemplated for early action; railroad definitely inquiring for 15 baggage and mail cars and five baggage cars.

United Fruit Co., 15 flat cars; bids asked.

Texas Co., 300 tons cars; bids asked.

Sheet Output Increases

Pittsburgh, Dec. 27.—Production of steel sheets increased from 65.9 per cent of capacity in November to 75.4 per cent in the first half of December, according to a semi-monthly report issued by the American Sheet & Tin Plate Manufacturers association. Unfilled orders at the close of November totaled 437,306 tons, and increased to 626,000 tons by Dec. 15. Production in the first half of December totaled 275,000 tons, compared with 230,041 tons in all of November.

Italian Prices Reduced

Milano, Dec. 19.—(*European Staff Service*)—The consortium of Italian steelworks recently met and decided upon further price reductions which amount to 50 lira ($2.73) per ton for concrete bars, 20 lira ($1.09) for I and U shapes, 40 lira ($2.18) for merchant bars, 40 lira ($2.18) for hoops and bands, 30 lira ($1.64) for wire rod, and 30 lira ($1.64) for billets ranging from 40 to 130 millimeters.

Wire

Nails Most Active Item—Specifications on Current Quarter Being Filed Fully

NAILS are most active among wire products and both jobbers and consumers are filing as large specifications are possible against low-priced contracts, which will expire this week. Mill operations have not increased on present volume of orders. Manufacturers are not specifying heavily, except skid chain makers. Prices are steady but untested.

WIRE PRICES, PAGE 1622

Chicago, Dec. 27.—Consumers of wire products are interested chiefly in specifications on contracts which expire at the end of this year. The new price base for nails therefore has not been given a rigid test. December shipments are ahead of a year ago. Jobber buying in the South and Southeast still is spotty. Wire nails generally are moving at $2.50 to $2.60, and bright plain wire is 2.40c to 2.45c, Chicago or western mill.

Pittsburgh, Dec. 27.—Nails are the most active item in wire products. Jobbers and users have been collecting all the tonnage they can on their low priced arrangements expiring this week. Base prices are $2.55 on nails and 2.40c on plain wire, but it will be some time before lower priced material disappears. Combined orders have not been enough to permit mills to increase operating schedules, and these remain at 50 per cent. Manufacturers' wire specifications have been light although auto skid chain manufacturers have taken fair tonnages in the past two months.

Detroit, Dec. 27.—Present quotations of 2.40c for plain wire and $2.55, Cleveland base, for wire nails are holding firm. Current demand is fairly satisfactory. Specifications against first quarter contracts are small but good business is in prospect.

Cold Finished Steel

Market More Stabilized and New Standards Being Applied

COLD FINISHED PRICES, PAGE 1622

Pittsburgh, Dec. 27.—Cold bar finishers claim the market presents a more stabilized appearance than in many weeks, contracting for first quarter proceeding with less resistance than usual. No deviations are encountered by those maintaining a 2.20c minimum, with the extra card of Oct. 17 applying. This card has been revised, effective Dec. 22, to conform to the hot bar card of Dec. 15 as far as differentials apply to quantities less than 4000 pounds, instead of to quantities less than 6000 pounds. While the present operating schedule here is 50 to 60 per cent, the outlook for increasing approximately 20 per cent by the middle of January is bright, based on actual specifications in hand and the way business is developing. This betterment is largely automotive but other consuming lines are represented.

Bolts, Nuts, Rivets

First Quarter Contracts Show Satisfactory Tonnage

NUT AND BOLT PRICES, PAGE 1622

Chicago, Dec. 27.—First quarter contracting for bolts, nuts and rivets is practically complete and shows a slight gain over fourth quarter volume. December specifications compare well with November. Farm implement interests continue active. Some spot business for bolts is being taken at 55 to 60 per cent off. The contract price of structural rivets is 2.85c, Chicago, with spot orders commanding 3.10c.

Pittsburgh, Dec. 27.—Conditions are quiet in nuts, bolts and rivets. Considerable contracting has been done in recent weeks and while some specifications already are in, most will develop within the next week or two. Jobbers and users have contracted ahead on nuts and bolts at 70 off (60 per cent is the discount on small quantities) and shops using large quantities of rivets have entered fairly large tonnages for car building and repairing, structural shape fabrication, and other purposes. These are at 2.75c. Operations are at 50 per cent of capacity.

Cleveland, Dec. 27.—Contracting for first quarter requirements of bolts, nuts and rivets is nearly complete, and in good volume, local makers report. Current specifications for bolts and nuts show less than the seasonal decline, but rivets are in poor demand. Optimism prevails over 1928 prospects.

Immigration in Net Gain

Washington, Dec. 27.—In October 208 immigrant iron and steel workers came into the United States while 23 left, according to the bureau of immigration, department of labor. From July to October 625 immigrant iron and steel workers entered the country and 117 left.

Strip Steel

Mills with Backlogs Find Little Profit on Business

STRIP PRICES, PAGE 1622

Pittsburgh, Dec. 27.—While many hot and cold strip makers enter the New Year with good backlogs, much is on unprofitable bases. A few makers have awaited improvements which now appear to be assured for early 1928, since signs of greater consumption already are appearing. Automotive demand recently has shown great improvement and other consuming lines appear to be getting ready to fall into step. Departures from 2.10c on hot, 2.30c on hoops and bands, and 3.00c on cold have been common although the trade hopes that when customers commence to specify these will become the firm market minimums for first quarter. Concessions have amounted to several dollars a ton in some cases. Strip mill operations have been averaging 60 to 65 per cent, but are scheduled to increase on or shortly after Jan. 15.

Cleveland, Dec. 27.—Specifications against fourth quarter hot strip steel contracts indicate that most buyers will have taken out all their coverage before Dec. 31. New buying is negligible, with most large consumers covered into tne first four or five months of 1928 at prices around 1.75c, Pittsburgh, for 6 to 12-inch widths. On spot business 1.80c, is firm, with 1.90c rumored as the first quarter spot price. Narrow strip is 2.10c, Pittsburgh. Cold finished strip has become more variable, and lots of 3 tons and over are 2.85c to 3.00c. Little first quarter cold strip buying is being done.

Employs Powdered Coal

All reheating furnaces which operate in conjunction with the rolling mills of the Central Iron & Steel Co., Harrisburg, Pa., now use powdered coal. Other improvements made by the company recently include the installation of a dolomite machine for making open-hearth bottoms; the consolidation of the ingot storage yards of the 126-inch sheared plate mill and the 42-inch universal plate mill; and the laying of a concrete floor equipped with nonskid floor plates over underground pipe lines in the 42-inch universal mill building.

Change Quantity Extras

Pittsburgh, Dec. 27.—Cold bar finishers have announced a change in their quantity differentials. The 20.00c extra heretofore applying on lots of 2000 to 5999 pounds will apply on lots of 2000 to 3999 pounds.

Nonferrous Metals

Stronger Tone Develops in Copper, Lead and Zinc Following Quiet Period—Fundamental Strength of Market shown by Resistance

Prices of the Week, Cents a Pound

	Copper—Electro delivered	Copper—Lake delivered	Copper—Casting refinery	Straits Tin—New York Spot	Straits Tin—New York February	Lead—New York	Lead—East St. Louis	Zinc—St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Dec. 21	13.97½	14.25	13.80	58.37½	58.12½	6.50	6.30	5.65	24.75	11.12½	35.00
Dec. 22	14.00	14.25	13.80	58.25	58.12½	6.50	6.30	5.62½	23.90	11.00	35.00
Dec. 23	14.05	14.25	13.80	58.25	58.12½	6.50	6.30	5.65	23.90	10.75	35.00
26 Holiday											
Dec. 27	14.05	14.25	13.75	58.12½	58.00	6.50	6.27½	5.62½	23.90	10.87½	35.00

NEW YORK, Dec. 27.—Fundamental strength in the nonferous metal markets was revealed in the way prices held through two weeks of dullness that followed the recent rise. Then just before the holiday period began a renewed show of firmness developed in copper, lead and zinc. The shading that took place in the past week was almost entirely on small lots that were pushed onto an unwilling market, while producers generally held at the highest prices at which they actually sold early in December.

Brass and copper mill products were unchanged, with most of them on the basis of 14.00c, Connecticut, for copper, and copper wire on the basis of 14.12½c for the base metal. Many mills are closed during the holiday period for inventories and repairs. Order books are a little better than they were a few weeks back.

Copper—Some metal sold below 14.00c, delivered, recently but who sought bargains said they were unable to find any tonnage at low prices. Toward the end of the week the market firmed up with more interest and business was done at 14.00c to 14.12½c, eastern points, with Midwest 14.25c. Most producers held at 14.12½c, Connecticut, through the dull period. Export business again was a big factor for strength, as it became active at midweek after a week or two of light sales. The official price is unchanged at 14.50c c.i.f. European ports.

Zinc—Some business was done in prime western at slightly easing prices, down to 5.62½c East St. Louis, on prompt and 5.65c on forward. At these figures the market became a little more steady and then the lower price on prompt disappeared.

Tin—The market had been quiet and unusually steady, a little over 58.00c. The premium on spot continues narrow but there is a little more spread between positions than recently. Users are fairly well covered for first quarter but it is believed more buying is to be done. Stocks in this country both in the hands of users and sellers, are light, but large shipments for the Far East this month probably will cause a big increase in the world visible supply.

Lead—Some prompt metal has been offered down on the East St. Louis basis but the bulk of the metal has been held at 6.30c to 6.35c and business done at this level, or 5 points over the prompt range. New York is unchanged at 6.50c.

Aluminum—The Aluminum Co. of America cut prices on ingot, the reduction on ordinary grades being 0.70 cents a pound to 24.30c. Importers had been below the domestic producer but have not announced their new prices. Little business has been signed for the next quarter.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
Yellow brass (high)	18.75
Copper, hot rolled	22.75
Lead, full sheets (cut ¼c more)	10.00
Zinc (100-pound base)	10.00
Aluminum, flat sheets, up to 10 gage, 3" to 72" wide	32.00
SEAMLESS TUBES	
Yellow brass (high)	23.62½
Copper	24.50
RODS	
Yellow brass (high, free turning)	16.50
Naval brass	19.25
WIRE	
Copper, small lots	15.62½
Yellow brass (high)	19.25

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	9.25 to 9.50
Chicago	9.25 to 9.50
Cleveland	9.75
HEAVY YELLOW BRASS	
Chicago	6.75 to 7.00
Cleveland	7.50
ZINC	
New York	3.50 to 3.75
Cleveland	3.50
HEAVY COPPER AND WIRE	
New York	11.25 to 11.50
Boston	10.75 to 11.25
Chicago	10.00 to 10.50
Cleveland	11.50
RED BRASS BORINGS	
New York	8.25 to 8.50
YELLOW BRASS TUBING	
Cleveland	8.00
LIGHT COPPER	
New York	9.75 to 10.00
Chicago	9.25
Cleveland	10.00
LIGHT BRASS	
Boston	6.00 to 6.50
Chicago	6.25
Cleveland	5.75
ALUMINUM	
Clippings, Cleveland	17.00
Borings, Cleveland	9.00
Cast, Cleveland	12.00
Cast, Boston	12.00 to 12.50

Secondary Metals

Remelt aluminum No. 12	17.00 to 18.00
Brass ingot, 85-5-5-5	12.50 to 12.62½

Coke By-Products

Toluol Continues the Most Active in By-Product Market

New York, Dec. 27.—Although reflecting seasonal dullness, the market on light oil distillates is unchanged. As has been the case for considerable time, toluol is in outstanding demand due to substantial buying by paint and lacquer manufacturers. Sulphate of ammonia continues to hold at $2.30 to $2.35, delivered, with spot demand from both domestic and export sources quiet. Ball and flake naphthalene are unchanged. Demand is quiet, with sellers looking for little improvement much before the middle of January.

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contracts
Pure benzol	$0.23	.....
90 per cent benzol	0.23	.....
Toluol	0.35	.....
Solvent naphtha	0.35	.....
Commercial xylol	0.36	.....
Phenol	0.19 to 0.20	.....

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.06
Naphthalene balls	0.06 to 0.07

Per 100 Pounds Delivered

Sulphate of ammonia	$2.30 to $2.35

Will Close Plant Jan. 1

New York, Dec. 27.—Richardson & Boynton Co. has decided to shut down indefinitely, Jan. 1, its plant at Dover, N. J. About 700 men will be thrown out of employment. The company has been shipping machinery and molds to Bethlehem, Pa., where it is rumored a new plant will be started. The Richardson & Boynton Co. was established in Brooklyn, N. Y. in 1837 and moved to Dover in 1898. The company has a plant at Buffalo which is also closed.

Exports of steam railway passenger cars from the United States in September totaled 17, Philippine islands receiving six, Mexico five, Cuba four and Canada two.

Warehouse

Demand Curtailed by Inventories and Seasonal Slack in Business—Philadelphia Jobbers Again Shading Prices

INVENTORIES and seasonal quiet in general business have contributed to diminished sales by iron and steel warehouses in the past week. In a number of cases December tonnage has been surprisingly large. Prices generally are holding firm with the exception being at Philadelphia.

Quiet prevails in the New York metropolitan warehouse market. Jobbers, however, are discounting the present lull as seasonal and are quoting prices steadily at last week's levels.

Buffalo iron and steel warehouses report the usual holiday collapse of business with little movement in any of the general merchant lines and prospects of continued dull business for another ten days.

Steel bars out of stock at Philadelphia reflect more stability since the recent announcement of 2.30c, base delivered locally by one jobber which sells at this price on 1-ton lots or larger, plus $2 a ton for smaller quantities than 2000 pounds. Lower prices have been named in a quiet way, some business having gone as low as 2.15c. Indications are that the longstanding price warfare at Philadelphia is less virulent, and expressions which are heard strongly indicate that jobbers are realizing the folly of price cutting. Adoption of quantity differentials by warehouses is becoming more prevalent, with such extras already applying on call finished bars and strip.

Seasonal influences are effecting the Detroit warehouse markets. Current demand is light and limited to small tonnages for immediate consumption. Operators look for improved buying after Jan. 1.

Cincinnati warehouses report that business in December will prove slightly better than in either November or October, both fair months. Some report business better than that of last December, while others report a falling off. Price strengthening, noted in outside markets, has not yet reached the Cincinnati warehouse business.

Sales from Cleveland warehouses in the past week have decreased further from the lessened levels of the preceding week. Several jobbers have called in their salesmen from the road until after the inventory period. Opinion generally holds that a slight but steady increase in sales volume may be expected beginning about Jan. 10. Prices are strengthened by rumors of further mill advances.

Approaching inventory and the holidays have adversely affected sales from stock at St. Louis. Demand for building materials has slumped, and with the exception of reinforcing concrete items, the movement is below that at the corresponding period a year ago.

Warehouse Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.00c
Ft. Worth	3.75c
Los Angeles	3.40c
New York	3.24c
Philadelphia	2.30c to 3.00c
Pittsburgh	2.85c to 2.90c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.75c to 4.06c

IRON BARS

Baltimore	2.60c to 3.31c
Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.00c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.50c to 3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.06c

REINFORCING BARS

Baltimore	2.80c to 3.31c
Boston	3.265c to 3.50c
Buffalo	2.75c
Cincinnati	3.00c
Cleveland	2.20c
Detroit	3.00c
Ft. Worth	3.75c
*Los Angeles	3.05c
**Los Angeles	3.30c
New York	2.95c
Philadelphia	2.30c to 3.00c
Pittsburgh	2.50c to 2.75c
*San Francisco	2.85c
**San Francisco	3.10c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.30c

*Carload. **Less carload.

STRUCTURAL SHAPES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland	3.00c
Detroit	3.10c
Ft. Worth	4.25c
Los Angeles	3.40c
New York	3.34c
Philadelphia	2.50c to 3.00c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

PLATES

Baltimore	2.60c to 3.41c
Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-in. and thicker	3.00c
Cleve., 3/16-in.	3.20c
Detroit	3.10c
Detroit, 3/16-in.	3.30c
Ft. Worth	4.50c
Los Angeles	3.40c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.50c to 3.00c
Phila., 3/16-in.	2.70c to 3.20c
Pittsburgh	3.00c
Portland	3.00c
San Francisco	3.15c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.75c to 4.16c

NO. 10 BLUE ANNEALED SHEETS

Baltimore	3.20c to 3.66c
Boston, 3/16-in.	3.915c
Buffalo	3.70c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.50c
Ft. Worth	4.70c
Los Angeles	3.85c
New York	3.50c to 3.89c
Portland	4.00c
Philadelphia	3.15c
Pittsburgh	3.10c to 3.20c
San Francisco	3.75c
Seattle	4.00c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.20c to 4.56c

NO. 24 BLACK SHEETS

Baltimore	3.60c to 4.30c
Boston	5.00c
Buffalo	4.20c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.75c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.10c
New York	3.75c to 4.00c
Philadelphia	4.15c
Pittsburgh	3.65c
Portland	4.90c
San Francisco	4.80c
Seattle	5.00c
St. Louis	4.45c
St. Paul	3.95c
Tulsa	4.75c

NO. 24 GALVANIZED SHEETS

Baltimore	4.30c to 5.45c
Boston	5.85c
Buffalo	5.05c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.50c
Detroit	4.90c
Ft. Worth	5.75c
Los Angeles	5.30c
New York	4.60c to 4.70c
Philadelphia	5.00c
Pittsburgh	4.50c
Portland	5.65c
San Francisco	5.35c
Seattle	5.75c
St. Louis	5.25c
St. Paul	4.90c
Tulsa	5.55c

BANDS

Baltimore	3.40c to 4.06c
Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.65c
Ft. Worth	4.40c
Los Angeles	4.25c
New York	3.99c
Philadelphia	3.40c
Pittsburgh	3.60c
Portland	4.00c
San Francisco	4.00c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Baltimore	4.16c
Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cincinnati	4.40c
Cleveland	3.65c
Detroit	4.15c
New York	4.49c
Philadelphia	3.65c
Pittsburgh	4.25c to 4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds, hexagons	Flats squares
Baltimore	4.00c	4.50c
Boston	4.05c	4.55c
Buffalo	3.95c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.65c	4.15c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	3.30c†	3.80c†
Philadelphia	3.25c†	3.75c†
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.
†Plus quantity extras.

COLD ROLLED STRIP

Boston, 0.100-inch, 500-lb. lots	6.00c
Buffalo	5.85c
Chicago*	6.10c
Cincinnati	7.15c
Cleveland*	5.95c
Detroit*	6.05c
New York	5.75c to 6.25c
Philadelphia	4.75c†

*Net base, straightening, cutting, boxing one ton or more.
†Plus mill, size and quantity extras.

SWEDISH IRON AND STEEL

New York duty paid

Hollow drill steel	14.00c
Iron bars, rounds	6.25c

Flats and Squares

Baltimore, New York, Phila.	6.60c

Coast Prices Are Down

Bethlehem Basing Causes Reduction Met by Other Makers—Demand Holds Well

SAN FRANCISCO, Dec. 24—(*By Air Mail*)—Awards of structural steel shapes, reinforcing bars and cast iron pipe during the present year have already exceeded the awards for 1926. Plate bookings will, evidently, fall about 10,000 tons below the total for last year. Interest this week was centered around the announcement of the Bethlehem Steel Co. that prices on plates and shapes would be reduced $1 a ton to correspond with its recent change in basing mill prices in the east. The new levels are now 2.35c c.i.f. on shapes, against 2.40c and 2.30c c.i.f., general, on plates. Other independent producers have not yet changed their prices but it is understood the leading interest will adjust its prices accordingly.

Pig Iron and Coke

Interest in foundry pig iron and coke is sluggish and no large inquiries and sales were reported. It is thought little real activity will develop during the remainder of the year. No change in prices is noted.

Coast Pig Iron Prices

Utah basic	$25.00 to 26.00
Utah foundry	25.00 to 26.00
*German	24.25
*Indian	25.00
*Dutch	24.50

*C.i.f. duty paid.

Bars, Plates and Shapes

Awards of concrete bars during the week aggregated 404 tons, bringing the total for the year to 59,619 tons, compared with 38,823 tons for the corresponding period in 1926. The largest award involved 140 tons for the branch city hall at Los Angeles, placed with the Los Angeles Iron & Steel Co. While no award has been announced on the 8500 ton Coyote Point bridge across San Francisco bay it is thought the Raymond Concrete Pile Co., general contractor, will place the material with an eastern producer. Bids open in Portland next week on 750 tons for the Veterans hospital. Prices on out-of-stock material in the bay district continue weak.

Plate activity is more pronounced than in many weeks and a number of good sized projects are pending. Awards so far this year are 63,086 tons, compared with 73,590 tons for the same period last year. The Steel Tank & Pipe Co. was low bidder on the Port Townsend, Wash., pipe line, involving 3000 tons of plates. Bids were also opened this week on 400 tons for a pipe line at Forest Grove, Oreg. The navy department is taking bids Jan. 3 for 250 tons for the Mare Island yard and the U. S. Engineers will open bids Dec. 27 for 175 tons of pontoon pipe. While some independent producers have not yet reduced their price on plates, Bethlehem and the leading interest are now quoting 2.30c c.i.f. on the general run of the market. On desirable lots 2.25c has been named.

Among larger lots of structural material placed this week were 2500 tons for the Firestone tire plant at Los Angeles, booked by the Llewellyn Iron Works and 800 tons for a bridge for the Western Pacific railroad, San Francisco, taken by the U. S. Steel Products Co. The Pacific Coast Engineering Co. took 600 tons for an apartment in San Francisco. New inquiries include 300 tons for a bridge in Idaho over the Snake river, 600 tons for a government building at Cristobal, Canal Zone, and 800 tons for an office building in Honolulu. Bids were opened this week on 400 tons for the Womens Athletic club, Oakland, Herrick Iron Works being low bidder. Pending business approximates 20,000 tons. Awards this week total 3950 tons, bringing the aggregate for the year to 134,138 tons, compared with 115,769 tons for the corresponding period in 1926. Prices are now firm at the new level of 2.35c c.i.f. as a result of the new basing method announced by Bethlehem.

Other Finished Material

The Southern Pacific Co., San Francisco, will open bids Dec. 26 for 28,000 kegs of track spikes, 3200 kegs of track bolts, aggregating 3120 tons, and 1,000,000 tie plates. Additional rail tonnage of some 24,000 tons, just placed by the same company, brings the total to 94,867 tons. This order involved 110 to 130 pound standard and girder rails and was apportioned as follows: to the Bethlehem Steel Co. 38,664 tons; to the U. S. Steel Products Co. 31,563 tons, and to the Colorado Fuel & Iron Co. 17,640 tons.

Cast iron pipe demand is active and some large lots are up for quotations. Bids were opened this week on 1856 tons for Los Angeles, B. Nicoll & Co. being low bidder. The largest award called for 340 tons for a water district at Redwood City, Calif. Awards aggregated 677 tons and brought the total for the year to 78,658 tons, compared with 74,366 tons for the same period last year. Portland, Oreg., will open bids Jan. 5 for 2825 tons, Nogales, Ariz., on the same date for 373 tons, Belmont, Calif., Jan. 9 for 188 tons and Eureka, Calif., Jan. 3 for 129 tons. Pending business exceeds 6000 tons. Grinnell Co. was low bidder on 625 tons of 8-inch seamless welded pipe for Los Angeles.

Large Tonnage

Pending in Northwest Coast Markets —Busy Season Seen

SEATTLE, Dec. 21.—While no large steel contracts have been placed in the Pacific Northwest this week, several jobs are immediately pending and within 30 days considerable tonnage will be awarded. Bids for the 27-story Northern Life Insurance building at Seattle, involving 2200 tons of shapes will be opened Friday. Two thousand tons of plates are involved in the Port Townsend pipe job, tenders for which were opened yesterday.

Some weakness has developed in mill prices on shapes and plates which have been steady at 2.40c for several months. Plates began to sag last month and structurals are said to be dropping in sympathy. Mill quotations range from 2.35c to 2.40c according to the job.

Pig Iron and Coke

The market is unchanged from last week in demand and prices. Foundry operations are much improved over 30 days ago and considerable activity is anticipated for the first three months of 1928. There is little buying as stocks on hand are ample.

Bars, Plates and Shapes

While no large contracts for reinforcing materials were let this week, local mills are unusually busy, figuring on a number of jobs, the total tonnage involved being considerable. Contracts up for figures include 110 tons for the Queen Anne high school addition, 80 tons for the Bartell warehouse and 180 tons for a 5-story garage at Fifth and Virginia streets. The Union Bag plant, Tacoma, will require considerable reinforcing. Local producers are bidding on 600 to 1000 tons involved in the Pacific Fruit Express Co. building at Fresno, Calif.

Mill prices on merchant bars are unchanged at 2.35c but the market on reinforcing is still open. The fight between local producing interests has practically eliminated foreign bars from this field. However, it is stated that about 12,000 tons of imported bars were received in Portland this year and 26 per cent of the bars consumed in California this year originated in foreign centers.

Wallace Bridge & Structural Steel Co. this week took a contract to furnish 350 tons of structurals for a 250-foot railroad logging bridge for the Hammond Lumber Co., at Foss, Oreg.

Rex Steel Stamping Co., Joliet, Ill., has made plans for resuming operations early in 1928 after being closed for several months.

Structural Shapes Down in November

Washington, Dec. 27.—Computed tonnage of structural steel orders for November is 213,060 tons, according to the department of commerce compared with 263,940 tons in October and 193,980 tons in November, 1926. Operations were at 67 per cent of capacity. Further comparisons follow:

	Actual tonnage	Per cent of capacity	Computed tonnage	Shipments computed
Total 1925	.....	....	2,760,660	2,796,000
Nov.	177,198	61	193,980	222,600
Total (11 mo.)	.....	67	2,327,760	2,629,860
Dec.	204,345	71	225,780	213,060
Total	.....	67	2,553,540	2,842,920
1927				
Jan.	155,978	54	171,720	174,900
Feb.	197,445	69	219,420	181,260
Mar.	186,388	66	209,880	200,340
Apr.	211,247	75	238,500	209,880
May	185,407	65	206,700	213,060
June	181,296	64	203,520	232,140
July	274,274	98	311,640	232,140
Aug	218,181	78	248,040	260,760
§Sept.	208,242	76	241,680	248,040
†Oct.	229,033	83	263,940	232,140
‡Nov.	180,483	67	213,060	219,420
(11 mo.)	.....	72	2,521,740	2,404,080

§Reported by 200 firms with a capacity of 281,035 tons.

†Reported by 187 firms with a capacity of 277,080 tons.

‡Reported by 177 firms with a capacity of 268,465 tons.

November Barrel Output on Decline

Washington, Dec. 27.—Production of steel barrels in November totaled 500,909, making a drop from the October total of 578,408, the department of commerce states. November shipments were 497,345.

Members of the Steel Barrel Manufacturers' Association, Cleveland, report 298,144 barrels shipped in November, with unfilled orders of 343,834. The volume of business in November was $929,364.12. I.C.C. barrels were produced at 31.7 per cent of capacity, light barrels at 43.8 per cent and all barrels at 41.1 per cent.

Monthly comparisons follow:

1926	Production	Shipments	Unfilled orders for delivery within 30 days	Unfilled orders for delivery beyond 30 days
Nov.	510,489	595,383	332,106	1,399,901
Dec.	539,805	546,392	349,491	1,496,496
1927				
Jan.	529,137	525,518	244,108	1,544,086
Feb.	504,134	503,183	252,012	1,411,760
Mar	575,850	568,821	285,802	1,260,278
Apr.	599,771	609,090	296,395	1,069,160
May	588,077	575,712	250,029	947,865
June	594,782	605,123	232,468	966,371
July	578,223	576,602	308,789	1,037,899
Aug.	615,152	610,454	244,518	862,086
Sept.	521,899	525,374	235,181	889,256
Oct.	578,408	572,893	211,665	788,894
Nov.	500,909	497,345	182,065	633,724

At their quarterly meeting in Chicago, Dec. 13, the directors of the Concrete Reinforcing Steel institute decided that the fourth annual meeting of the organization would be held at Biloxi, Miss., March 19-21. The Edgewater Gulf hotel will be the official headquarters.

Malleable Castings Total Shows Loss

Washington, Dec. 27.—Production of malleable castings in November totaled 40,845 tons, somewhat behind the October total of 46,765 tons. The November, 1926, figure was 45,793 tons, according to department of commerce statistics. Bookings also declined. Operations were at 40.5 per cent of capacity. Further comparisons follow:

	Total tons produced	Per cent of capacity	Total tons booked	Monthly capacity
Total 1925	737,532	54.4	653,233	1,355,315
1926				
November ..	45,793	42.7	40,294	**107,185
(11 mos.).	.665,737	55.3	567,898	1,204,058
December ..	50,017	48.2	40,051	103,831
Total	715,384	54.7	607,949	1,307,889
1927				
January ..	*51,492	48.8	50,994	105,619
February ..	*57,380	54.8	58,039	104,686
March	66,372	62.2	53,597	106,698
April	59,225	55.8	56,326	106,163
May	57,655	54.1	49,482	106,473
June	58,972	55.3	46,178	106,736
July	48,202	43.9	45,782	104,287
August	51,394	48.6	42,515	105,717
September..	45,210	43.3	37,912	104,401
October	46,765	46*	39,494	101,606
November....	40,845	40.5	34,624	100,778
Total (11 mos.).	.583,512	50.6	514,943	1,153,164

**Capacity since May has been based on following formula: "Total number of units of molding floor space, times average production per molder per day per unit of floor space, times number of actual working days per month."

Pig Iron Market Active

(*Concluded from Page* 1623)

mainly to the broadening scope of motor car manufacture. Sales reported during the past week by furnace interests with headquarters in Cleveland totaled 52,000 tons. This indicates a continued flow of good size orders, despite the fact that much of the business for first quarter was considered closed previously. One of the leading merchant interests booked more iron in December than in any month since the heavy period of June, 1925. December shipments are as good as those of any month in 1927. The situation has been helped by the fact the motor car industry completed its inventories earlier than usual, and few orders for pig iron have been suspended owing to plant shutdowns. Prices are steady, with $18, base, furnace, the ruling quotation for local delivery, and $16.50 to $17, base, furnace, for outside shipment, depending on freight rates.

Philadelphia, Dec. 27.—Pig iron demand reflects the holiday quiet. Several thousand tons of foundry iron was bought in the past week comprising small lots, generally at $19, base, eastern Pennsylvania furnace. Some iron still is bringing $19.50, base. Two thousand tons of basic iron was bought recently at around $19.75, delivered in this territory. Low phosphorus iron sales are restricted to a few carloads at unchanged prices. From Virginia comes word of the purchase of about 10,000 tons of Virginia pipe iron. The Virginia foundry iron market now is $20 to $20.50, base, furnace. Columbia Sanitary Casting Co. is inquiring from Louisville, Ky., for 300 tons of foundry iron for its Mott plant at Trenton, N. J.

Pennsylvania railroad is inquiring for 200 to 600 tons of foundry iron for Altoona, Pa. No shipment time is specified. The Pennsylvania railroad of late has been putting out inquiries monthly.

Cincinnati, Dec. 27.—Sales of southern pig iron here reveal the decision of producers to continue the last quarter 1927 price into the first quarter of 1928, namely $16, base, Birmingham. The Republic Iron & Steel Co. made the first announcement. Local offices of the company booked 2100 tons for first quarter and other sales amounted to around 7500 tons. The Louisville & Nashville inquiry for 225 tons of foundry iron has not been reported closed. Northern foundry sales total around 5000 tons in central and southern sections of Ohio and Indiana.

St. Louis Dec. 27.—Purchasing of pig iron in the past week was small. A total of approximately 1800 tons was reported. Sales were about evenly divided between northern and southern iron. The latter is on a basis of $16, Birmingham. Northern iron is offered in this district at a price figuring $18.50, Chicago, and the leading local producer quotes $19.50 to $20, f.o.b. Granite City. Both the local and Chicago interests, however, are understood to be meeting competition.

Birmingham, Ala., Dec. 27.—Pig iron makers are opening their books for first quarter, quoting $16, base, Birmingham, the price that has been prevailing for some weeks. As a consequence, the probable output for January has been sold. Surplus stock of foundry iron is about equal to what is was in mid-summer.

Toronto, Ont., Dec. 27.—First quarter buying of pig iron is on a larger scale in the Canadian markets. Several large contracts have been closed with Ontario and Quebec melters. Inquiry shows an increase. Spot shipments, probably due to year-end conditions, show a slight decline. Toronto prices on No. 2 foundry iron and malleable are $23.60. At Montreal No. 1 and No. 2 foundry and malleable are $25 and basic $24.

The American Engineering council will conduct its annual meeting in Washington, Jan. 10-11. Chief topics of discussion will be flood control and reorganization of the department of the interior. Sir Esme Howard, British ambassador to the United States, will be the chief speaker at the dinner to be served on the evening of Jan. 10.

Morgan Is New Corp. Chairman

Head of Famous Banking House Heads United States Steel—Myron C. Taylor Takes Helm of Finance Committee while James A. Farrell, Still President, Becomes Chief Executive Officer—Gary Vacancies now Filled

NEW YORK, Dec. 27.—J. Pierpont Morgan, head of the banking house of J. P. Morgan & Co., New York, was today elected chairman of the board of directors of the United States Steel Corp.

Myron C. Taylor, New York financier, whose chief identification has been with the textile industry, was chosen chairman of the Corporation's finance committee.

James A. Farrell will continue as president of the Corporation and becomes its chief executive officer under the direction and supervision of the finance committee and the board of directors.

This action by the board of directors of the Corporation remedies the deficiencies in the corporation organization resulting from the death, last Aug. 15, of Judge E. H. Gary, who was chairman both of the board and of the finance committee.

None of the directors of the Corporation, following the meeting, would discuss developments beyond the brief statement announcing the selections.

Today's action continues the direction of the Corporation in the hands that have been guiding it since the death of Judge Gary. Mr. Farrell has been functioning as the chief executive officer in the interim, and it was expected that he would so continue.

It was the backing of the senior Mr. Morgan, father of the new chairman, which enabled the late Judge Gary to organize the Corporation in 1901. Despite frequent importuning by Judge Gary, the senior Mr. Morgan restricted his public affiliation with the Corporation to a membership on the board. The new chairman, who is 60 years old, has been the head of the House of Morgan since 1913. Following his graduation from Harvard university in 1889, he entered the London branch of J. P. Morgan & Co., remaining there until 1901, when he became a member of the firm. After January, 1915, the House of Morgan was commercial agent of the British government in the United States and conducted and supervised the purchase of war munitions and supplies in the United States.

Mr. Taylor, who will shortly be 54 years old, has been affiliated with a number of textile and spinning companies, chiefly in the New England district. His connections have included the New Bedford Spinning Co., the Passaic Cotton Mills, the Penrod Mills, the American Tire Fabric Co., the Lorraine Securities Corp. and the Guarantee Trust Co. Since the death of Judge Gary his name has repeatedly been linked with a high office in the Corporation.

Mr. Farrell for 16 years has been president of the Corporation, a member of the finance committee and has been active in the formulation of operating policies of the various subsidiaries. It is expected that Messrs. Morgan and Taylor, neither of whom has ever had active personal participation in the production or marketing of iron and steel, will devote their energies chiefly to matters of finance and public and that Mr. Farrell will continue dominant so far as iron and steel matters are concerned.

Steel Treaters Plan for Montreal Meeting

For the first time in its history, the American Society for Steel Treating will conduct a meeting in Canada, plans now being under way for the semiannual gathering at the Mount Royal hotel, Montreal, Feb. 16-17. As usual, the schedule will call for meetings of the board of directors and certain committees, technical sessions, plant inspections and entertainment. Opportunity also will be afforded for the visitors to participate in Montreal's winter sports: The tentative program is as follows:

Wednesday, Feb. 15

9:30 a.m.—Board of directors' meeting.
Recommended practice committee meeting.
Publication committee meeting.
6:00 p.m.—Early bird's dinner.
7:30 p.m.—Toboggan party or theater party.

Thursday, Feb. 16

9:30 a.m.—Technical session.
2:00 p.m.—Technical session.
6:30 p.m.—Dinner and technical session.

Friday, Feb. 17

9:30 a.m.—Technical session.
1:30 p.m.—Plant inspection to Canadian Steel Foundries; Vickers Ltd.; Dominion Engineering Works Ltd.; and Dominion Iron Works Ltd.
6:30 p.m.—Dinner and technical session.

Among papers to be read and their authors are the following:

"Effects of Antimony, Arsenic, Copper and Tin in High-Speed Tool Steel," by H. J. French and T. G. Digges, bureau of standards, Washington.

"New Methods of Examining Structures," by R. G. Guthrie, People's Gas Light & Coke Co., Chicago.

"Spheroidizing," by V. O. Homerberg, Massachusetts Institute of Technology, Cambridge, Mass.

"High and Low Manganese in Steel," by V. N. Krivobok, Carnegie Institute of Technology, Pittsburgh.

"The Present Trend of Metallurgy," by Dr. F. C. Langenberg, Climax Molybdenum Co., New York.

"Alloy Steels in Boiler Construction," by Charles McKnight, International Nickel Co., New York.

"Manufacture of Stainless Steel Castings in the Various Industries," by V. T. Malcolm, Indian Orchard, Mass.

"Metallurgy of Welding," by S. W. Miller, Union Carbide & Carbon Research Laboratories, Long Island City, N. Y.

"Cast Iron," by B. F. Shepherd, Ingersoll-Rand Co., Phillipsburg, N. J.

"Physical Properties and Structure, Longitudinally and Transversely, of Teat-Treated Chromium-Molybdenum Sheet of Various Sizes," by F. T. Sisco, Wright Field, Dayton, O.

"Medium-Carbon Pearlitic Manganese Steels," by Jerome Strauss, United States navy yard, Washington.

Appleton Steel Tube Co. Is Organized

Organization of Appleton Steel Tube Co., with capital stock $100,000 by business men of Appleton, Wis., has been effected to re-establish the local industry formerly conducted as the Seamless Steel Tube Co., which ceased production some time ago. The plant is being reconditioned and new equipment installed. It is planned to reopen the works Feb. 1 or 15 and manufacture seamless tubes in ½ to 3-inch sizes. A specialty will be made of steel conduit. The new company has re-engaged L. E. Johnson, formerly works manager, now with tube mills in Pennsylvania, who will return about Jan. 1. John M. Balliet is president of the new company.

Sloss-Sheffield Veterans Form Club

Fifteen officers and employes of the Sloss-Sheffield Steel & Iron Co., Birmingham, Ala., who have been with the company 25 years and more continuously, have formed a Quarter of a Century Class. Davis S. Anderson, attorney and chairman of the safety department, is chairman. Organization was perfected at a dinner. Hugh Morrow, president, and Russel Hunt, secretary-treasurer, are members.

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

SIMMONS MACHINE TOOL CORP., Albany, N. Y., has purchased the plant of the General Railway Signal Co. in that city. The property, valued at $450,000, comprises 10 acres and several factory buildings with 121,000 square feet of floor space. The main building is brick, steel and concrete. Other buildings include a machine shop, blacksmith shop, and heat-treating building. It is reported the Simmons corporation purchased the property for expansion purposes, although this lacks official confirmation.

* *

MACKINTOSH ENGINEERING CO., Cleveland, has moved its offices and warerooms to 1452 Buhrer avenue S. W. Parts for its portable conveyors will be carried there.

* * *

LACLEDE-CHRISTY, St. Louis, manufacturer of refractories, has moved its general offices from the Railway Exchange building to 1711 Ambassador building.

* * *

REMINGTON RAND INC., Ilion, N. Y., has moved its general purchasing office in the Remington Typewriter company office building, East Clark street, Ilion, in charge of L. Rayburn, director of purchases.

* * *

DAYTON-DUNBAR INC., 149 Broadway, New York, has been appointed exclusive sales representative in New York district to handle a new line of lathes for the Sidney Machine Tool Co., Sidney, O.

* * *

AUTOMATIC GAS-STEAM RADIATOR CO., Pittsburgh, will improve recently-purchased property with a brick and steel manufacturing plant. It is estimated that the improvements will cost about $100,000.

* * *

STEEL RE-ENFORCEMENT CO., Liberty, Ind., recently organized by Elmer Bossert, has decided to establish its offices in that city. It will manufacture diamond mesh steel reinforcement for concrete road work and steel for bridges and buildings.

* * *

FULTON-HARWOOD BRASS FOUNDRY CO., operated by Ferrie H. Fulton and Lawrence J. Harwood, has been sold to J. Howard Ware and associates and will be operated under the name Fulton-Harwood Brass & Aluminum Co. Mr. Ware formerly was associated with a Detroit brass and aluminum foundry.

* * *

CARBON ENGINEERING CO., Slinger, Wis., has been incorporated as a reorganization of the Carbon Engineering Co., 1700 Eighth avenue, Milwaukee. The plant of the former Vim Tractor Co. at Slinger has been bought and is being remodeled and equipped for the manufacture of carbons and other parts for electrical units. Walter O. Helwig is president and general manager.

* * *

AURORA X-RAY MFG. CO., Aurora, Ill., has been formed and incorporated to manufacture machines for the production of X-rays. The equipment is of a new type for which patents have been asked. Plans are being considered for a new plant in 1928. J. Bentson is president; C. Hanson, vice president; H. T. Bentson, secretary; E. S. Humphreys, treasurer; R. M. White, general manager.

* * *

MORRIS FOUNDRY, 20 East Sibley street, Fond du Lac, Wis., has been incorporated with $100,000 capital under the title of Morris Foundry, Inc. It is a large manufacturer of brass, bronze and aluminum castings and machined parts. There is no change in ownership of the management. Newton Morris is principal owner and president.

* * *

TITCHENER IRON WORKS, manufacturer of fencing and structural iron specialties, Binghampton, N. Y., is being reorganized. The following officers will be elected the first of the year: President, Renna Z. Spaulding; vice president and general manager, C. Y. Cushman; secretary and treasurer, John B. Delavan. These officers and Max Delavan will make up the board of directors.

* * *

KITTS STEAM SPECIALTY CO., Oswego, N. Y., has been bought by Thomas J. Fitzsimmons and will be operated by a new company under the same name. Mr. Fitzsimmons is president, with M. A. Skelly, vice president, and I. C. Fitzsimmons, secretary and treasurer. The new company will continue the manufacture of steam specialties, including steam traps, damper regulators and boiler feeders.

* * *

WARNER GEAR CO., Muncie, Ind., is building an addition 145 x 180 feet, monitor construction, a further unit in the building program undertaken two years ago. A 2-story office building remains to be constructed. The new building will allow general expansion of manufacturing facilities, all departments gaining space. The company now has more than five acres under roof, devoted to manufacture of automotive transmissions for all types of cars and trucks.

* * *

TRIO BRASS FOUNDRY CO., Aurora, Ill., manufacturer of brass and aluminum castings, has moved into its new plant at 483 South River street. William Barbel and Otto Bergmann, who compose the firm, formerly were connected with the American Woodworking Co., and the latter had many years experience in brass casting in Norway. The plant is equipped with a new sandblast, three new furnaces, an overhead pouring track and fireproof pattern vault.

* * *

CHAIN BELT CO, Milwaukee, has purchased the pump and saw-rig business formerly owned by C. I. Longenecker, 251 Reed stret, Milwaukee, the third acquisition this year. Some time ago the Chain Belt Co. took over the Stearns Conveyor Co., Cleveland, and more recently the plaster and mortar mixer business of the Atlas Engineering Co., Milwaukee. All of the new local lines will be made in the Milwaukee plant of the company. The Stearns works in Cleveland will continue to manufacture belt conveyors only.

Discusses New Bases

Washington, Dec. 27.—Formal cognizance of the action of the Bethlehem Steel Co. in making its eastern plants basing points for heavy steel products made there has been taken by the federal trade commission in referring the matter to its board of review. It is believed that the original merger complaint against the Bethlehem company will be dismissed.

November Exports, Imports Up

Iron and Steel Shipments Abroad, at 177,928 Tons, Almost Thrice Month's Receipts —Fall Short, However, of Year Ago—Tin Plate Leads Exports, While Pig Iron Tops Imports—Year's Exports Ahead, Imports Behind

NOVEMBER iron and steel exports and imports increased. Exports gained 7673 tons over October, totaling 177,928 tons, while imports were 61,882 tons, an increase of 9389 tons over the previous month according to the iron and steel division of the department of commerce.

Imports of pig iron were almost doubled in November compared with October, and had much to do with making the first import gain since August. Pig iron imports totaled 16,142 tons in November and 8178 tons in October. Structural shapes, the leading import in October, totaled 14,479 tons, a slight gain over October. Cast iron pipe, another leading import in November, totaled 4042 tons, somewhat lower than the October figure.

Scrap, the principal export in October, with 25,231 tons, totaled only 15,392 tons in November. However, tin plate exports were high with shipments of 18,121 tons, rails with 10,849 tons and skelp with 14,667 tons.

Total exports for the 11 months of 1927 were 2,012,541 tons compared with 1,969,022 tons for the corresponding period of 1926. The imports total for the 11-month period is 686,279 tons, a decline from 1,034,583 tons, the figure for the corresponding period in 1926.

Exports of galvanized sheets, totaling 10,458 tons in November, slightly increased from the November total of 9709 tons. Canada received 1186 tons of that total, Brazil 1291 tons and Argentina 1029 tons. Steel bars increased also, in November, totaling 10,642 tons in that month, compared with 9207 tons in October. Canada received the most steel bars, taking 6471 tons of the total, while United Kingdom received 1356 tons.

Netherlands, which received 9349 tons of steel scrap in October, took none at all in November, which helped lower the tonnage in that classification. Japan's total of 8148 tons in November was higher than its October receipts. Canada took less scrap in November than in October.

The increase in pig iron imports was due mainly to United Kingdom and British India. United Kingdom sent 3173 tons of pig iron in November compared with 190 tons in October, and British India shipped 9245 tons to the United States compared with

IMPORTS AND EXPORTS
Gross Tons

	—1927—		—1926—	
	Imports	Exports	Imports	Exports
Jan.	63,404	215,235	79,067	174,585
Feb.	49,451	166,128	100,213	157,187
March	61,872	171,094	93,107	169,438
April	60,374	192,339	107,636	194,449
May	79,814	202,708	108,781	173,418
June	69,017	184,364	124,215	159,506
July	61,112	190,502	82,411	194,717
Aug.	68,386	175,636	91,578	171,588
Sept.	58,464	166,352	85,484	182,071
Oct.	52,503	170,255	81,830	172,070
Nov.	61,882	177,928	81,259	219,830
Dec.	.....	.....	75,559	198,189
Total	686,279	2,012,541	1,111,090	2,167,048

ORIGIN OF PIG IRON IMPORTS
Gross Tons

From:	Nov.	Oct.
Germany	340	.....
Netherlands	2,882	2,260
Sweden	502	32
United Kingdom	3,173	190
British India	9,245	5,196
France	.....	500
Total	16,142	8,178

ORIGIN OF IRON ORE IMPORTS
Gross Tons

From:	Nov.	Oct.
Brazil	6,100	.....
United Kingdom	62	200
Canada	3,007	423
Cuba	22,500	25,500
Chile	141,300	121,800
Algeria and Tunis	26,599	48,999
Germany	.....	50
Spain	.....	448
Total	199,568	228,275

ORIGIN OF MANGANESE IMPORTS
(Concentrates)
Gross Tons

From:	Nov.	Oct.
Soviet Russia in Europe	12,022	4,755
Canada	57	12
Brazil	9,912	2,455
British India	4,748	7,271
Java	.....	286
Other countries	.....	1
Total	26,739	14,780

ORIGIN OF FERROMANGANESE IMPORTS
Gross Tons

From:	Nov.	Oct.
France	4	.....
Sweden	16	8
United Kingdom	743	657
Canada	1,706	1,444
Total	2,469	2,109

ORIGIN OF IMPORTS
Gross Tons

From:	Cast iron pipe	Steel bars	Ingots, blooms, etc.
Philippine Islands	311	.....	.....
Cuba	648	.....	.....
Honduras	256	.....	.....
Canada	112	42	6
Austria	.....	66	.....
Belgium	.....	2,452	704
France	.....	1,160	330
Germany	.....	955	42
Netherlands	.....	205	.....
Sweden	.....	592	99
United Kingdom	.....	169	5
Czechoslovakia	.....	13	1
Argentina	.....	.....	.....
Other countries	683	.....	.....
Total	2,010	5,654	1,187

Exports of Metalworking Machinery

In number except where otherwise specified

	November		Jan. through Nov.	
	1927	1926	1927	1926
Engine lathes	136	37	637	256
Turret lathes	39	18	249	139
Other lathes	58	40	405	575
Vertical boring mills and chucking machines	15	3	108	70
Thread-cutting and automatic screw machines	109	81	848	746
Knee and column type milling machines	22	27	207	194
Other milling machines	74	11	414	343
Disk type gear-cutting machines	5	1	40	12
Other gear-cutting machines	31	6	324	177
Vertical drilling machines	79	38	307	310
Radial drilling machines	6	1	87	65
Sensitive drilling machines	26	5	468	809
Other drilling machines	47	31	834	1,069
Metal-sawing and cutting-off machines	24	14	254	188
Shapers and slotters	28	26	322	515
Planers	....	....	37	14
External cylindrical grinding machines	80	42	650	462
Internal grinding machines	148	32	530	220
Metalworking tool-sharpening machines	49	40	754	833
Other metal-grinding machines, pounds	201,583	51,966	1,239,963	651,364
Sheet metalworking machines, pounds	544,298	301,531	4,798,180	5,996,476
Plate metalworking machines, pounds	43,192	10,854	1,012,995	413,372
Rod or wireworking machines, pounds	79,525	2,383	456,095	366,546
Forging machinery, pounds	420,989	271,476	4,246,056	5,604,257
Rolling-mill machinery, pounds	518,126	562,211	6,949,492	4,447,334
Foundry and molding equipment, pounds	481,102	675,403	7,456,735	6,101,876
Other power-driven metalworking machinery and parts, pounds	437,343	786,207	5,875,359	7,395,353
Hand or foot-operated metalworking machinery and parts, pounds	29,539	12,306	235,834	247,457
Pneumatic portable tools	1,817	1,429	18,043	16,262
Other portable metalworking machines, pounds	27,200	48,959	327,374	290,854
Chucks for machine tools	1,980	690	15,100	17,110
Reamers, cutters, drills, taps, dies and other metalworking tools, pounds	.....	345,291	.....	2,553,355

5196 tons in October. Sweden's shipment total increased notably also.

Auto Production at Record Low

Washington, Dec. 27.—Production of passenger cars and trucks in the United States in November totaled 133,202, the lowest in years, according to the department of auto production statistics, all of which have just been revised. October production was 219,610, while November, 1926, totaled 256,300. Canadian production also was low totaling 6617. Monthly comparisons follow:

	United States			Canada*
1926	Total	Passenger cars	Trucks	Total
January	309,544	277,831	31,713	15,479
February	364,179	325,122	39,057	18,838
March	434,467	387,570	46,897	22,374
April	441,306	389,833	51,473	21,502
May	421,179	375,317	45,862	24,934
June	387,900	343,708	44,192	21,751
July	359,275	319,688	39,587	15,208
August	426,605	382,651	43,954	15,261
September	395,687	352,202	43,485	17,495
October	334,421	292,562	41,859	14,670
November	256,300	222,419	33,881	9,828
(11 mos.)	4,130,863	3,668,903	461,960	197,340
December	167,922	139,850	28,072	7,752
Total	4,298,785	3,808,753	490,032	205,092
1927				
January	238,926	199,650	39,276	15,376
February	304,753	264,171	40,582	18,655
March	394,417	345,911	48,506	23,250
April	404,737	357,009	47,728	24,611
May	404,097	357,148	46,949	25,708
June	321,946	278,728	43,218	19,208
July	268,469	236,866	31,603	10,987
August	308,782	274,350	34,432	12,526
September	260,378	226,440	33,938	11,262
October	219,610	182,941	36,669	7,791
November	133,202	108,903	24,299	6,617
(11 mos.)	3,259,317	2,832,117	427,200	175,991

*Reported by Dominion bureau of statistics.

Orders Slackening For Foundry Equipment

Cleveland, Dec. 27.—A slight drop in orders for foundry equipment was noted in November, according to the Foundry Equipment Manufacturers' association. With a base of 100 representing average monthly shipments for 1922-23-24, November has a rating of 95.8 compared with 98.0 in October. Comparisons follow:

	1924	1925	1926	1927
Jan.	141.8	104.2	168.2	180.4
Feb.	121.0	108.8	154.9	198.0
Mar.	121.9	159.3	157.3	131.1
Apr.	146.8	124.3	113.2	130.0
May	108.4	113.3	128.5	134.8
June	96.4	110.5	133.5	138.4
July	62.8	117.0	127.3	89.9
Aug.	77.5	190.0	141.2	106.4
Sept.	66.0	94.2	114.0	80.4
Oct.	85.5	149.5	140.5	98.0
Nov.	91.0	180.3	133.4	95.8
Dec.	137.8	140.1	181.0	

Base: Average monthly shipments for 1922-23-24.

Plate Bookings Drop

Washington, Dec. 27.—Fabricated steel plate bookings for November dropped considerably, totaling 26,940 tons compared with 46,540 tons in October and 63,119 tons in November, 1926, according to the department of commerce. Comparisons follow:

Total	*Total	Oil storage tanks	Gas holders	Blast furnaces	Stacks and miscellaneous
1923	581,873	303,416	53,415	9,815	161,513
1924	348,332	124,959	50,641	12,601	130,822
1925	385,524	99,134	42,273	12,651	165,289
1926					
Nov.	63,119	26,269	4,531	418	11,406
Total (11 mos.)	484,055	165,891	45,666	12,615	184,222
Dec.	29,858	9,476	1,858	1,791	12,627
Total (year)	513,913	175,367	47,524	14,406	196,849
1927					
Jan.	35,854	14,342	1,994	568	9,839
Feb.	59,643	32,983	3,334	606	16,647
March	55,407	24,127	5,135	857	17,900
April	47,347	18,019	9,450	420	15,069
May	37,883	10,855	2,524	364	20,865
June	28,811	7,402	2,263	1,026	15,192
July	*35,326	17,199	1,034	537	*14,274
Aug.	*48,577	*29,691	3,504	481	11,385
Sept.	38,662	15,421	2,254	873	14,576
Oct.	46,540	18,098	3,252	385	11,599
Nov.	26,940	8,920	978	422	10,393
Total (11 mos.)	461,098	197,057	35,722	6,539	157,829

*Revised.

Stoker Sales Still Low

Washington, Dec. 27.—Mechanical stoker sales continued to decline in November, totaling 76, compared with 95 in October and 85 in November, 1926, according to the department of commerce. Comparisons follow:

	Stokers sold	Fire tube boilers	Water tube boilers
1923 Total	1,464	177	1,287
1924 Total	1,128	161	967
1925 Total	1,348	263	1,085
1926			
November	85	25	60
December	72	7	65
Total	1,361	289	1,072
January, 1927	69	18	51
February	105	27	78
March	115	25	90
April	77	22	55
May	97	16	81
June	153	49	104
July	136	42	94
August	160	60	100
September	104	48	56
October	95	37	58
November	76	35	41

DESTINATION OF NOVEMBER IRON AND STEEL EXPORTS

Gross Tons

	Rails	Galvanized sheets	Plates not fabricated	Tin terne plate	Steel sheets, black	Barbed wire	Steel bars	Steel scrap
Argentina	.....	1,029	.....	1,281	.....	663	.....	.....
Australia	.....	254	195	.....	365	5	.....	.....
Belgium	28	.....	.....	.....	.....	.....	.....	.....
Brazil	4,223	1,291	118	695	.....	1,088	264	.....
British India	.....	69	.....	.....	.....	.....	.....	.....
British S. Africa	.....	42	.....	.....	.....	151	.....	.....
Canada	913	1,186	10,340	2,114	3,537	133	6,471	5,951
Central America	70	315	285	.....	127	268	122	.....
Chile	297	.....	111	684	.....	.....	.....	.....
China	2,458	38	.....	1,521	.....	.....	3	56
Colombia	103	767	71	200	.....	194	.....	.....
Cuba	211	537	20	165	.....	444	278	45
Dutch E. Indies	.....	926	.....	.....	.....	.....	.....	.....
Dutch W. Indies	.....	.....	.....	80	.....	.....	.....	.....
Egypt	.....	.....	.....	.....	.....	.....	.....	6
Europe	.....	.....	110	.....	86	.....	45	.....
Japan	67	41	.....	2,790	2,942	.....	689	8,148
Mexico	1,493	369	14	1,227	161	342	50	657
Norway	.....	185	.....	.....	.....	.....	.....	.....
Other Europe	.....	283	.....	1,487	.....	.....	.....	.....
Peru	143	.....	1	873	60	.....	81	.....
Philippine Islands	434	.....	.....	254	330	263	121	.....
United Kingdom	.....	.....	.....	.....	289	.....	1,356	529
Uruguay	.....	.....	.....	61	.....	.....	.....	.....
Venezuela	54	.....	.....	116	.....	.....	.....	.....
	10,799	10,458	11,453	18,121	9,614	4,063	10,642	15,392

Steel Castings Orders Show Increase

Washington, Dec. 27.—November bookings of steel castings totaled 65,634 tons, compared with 49,002 tons in October and 71,184 tons in November, 1926, according to department of commerce figures. Production in November totaled 60,407 tons. November production was at 45 per cent of capacity. Further comparisons follow:

	BOOKINGS		PRODUCTION	
1926	*Total net tons	Railway specialties	*Total net tons	Railway specialties
Nov.	74,124	28,079	86,626	24,421
11 mos.	909,958	344,367	1,012,830	374,717
Dec.	86,006	38,111	82,336	28,699
12 mos.	996,266	382,478	1,095,166	403,416
1927				
Jan.	101,768	48,717	84,764	32,982
Feb.	91,797	39,792	85,464	33,250
March	82,558	31,380	97,329	38,784
April	78,352	31,004	90,570	36,693
May	66,736	24,644	81,950	31,659
June	84,675	34,702	82,118	30,538
July	72,012	29,979	75,551	29,679
Aug.	61,369	20,220	83,210	29,774
*Sept.	50,630	17,591	67,077	23,744
*Oct.	49,002	15,375	58,982	19,896
Nov	65,634	27,357	60,407	18,001
11 mos.	804,544	320,761	867,332	325,000

*For tonnage of miscellaneous castings deduct Railway Specialties from this total.
**Revised.

Orders Spike Machines

Republic Iron & Steel Co., Youngstown, O., will re-engage in the manufacture of railroad spikes. Four automatic machines, with a monthly capacity of 1000 tons, have been purchased and production is expected to start in January 1928. Railroad spikes formerly were included in the company's list of products.

Of the $107,294 worth of pneumatic portable tools exported in September $26,448 went to the United Kingdom, $14,603 to Canada, $11,366 to Chile and $10,802 to France.

Industrial Men in the Day's News

Frederick H. Payne, New President of Associated Industries of Massachusetts

ELECTION to leadership of an influential eastern industrial organization which he helped to organize adds a further honor to his already long list.

CALLED to the active direction of his company in 1924, he since has made a record of increasing profits to which his previous banking experience has contributed.

A MAN of few interests outside of business, he, nevertheless, is active in municipal work and travels frequently. He is punctilious in his business habits.

ELECTION to the presidency of the Associated Industries of Massachusetts is an honor which Frederick H. Payne values highly, although it is but one of many distinctions he has achieved. He has served as president of the American Hardware Manufacturers association and as vice president of the association which he now heads.

Mr. Payne was born in Greenfield, Mass., Nov. 10, 1876, and after leaving school there entered the employ of the First National bank at Greenfield. After 14 years' experience with this bank he was appointed bank examiner of the Commonwealth of Massachusetts, and later became president of the Mechanics Trust Co. of Boston. In 1910 he was appointed vice president of the Federal Trust Co., Boston, and in 1912 became one of the organizers and treasurer of the Greenfield Tap & Die Corp., Greenfield, Mass.

When the United States entered the World war, Mr. Payne severed active connection with the Greenfield company and was appointed district procurement officer of the Bridgeport, Conn. district. Later he was commissioned major of ordnance in the United States army. About that time he became an active partner in Tucker, Anthony & Co., Boston and New York. After the armistice he was appointed a member of the claims board, and later received a commission as lieutenant colonel of ordnance in the reserve corps. For several years immediately after the war he was located in New York, and his interests were chiefly those of the banking firm of which he was a partner.

Colonel Payne began to see that the Greenfield corporation could not be directed from a distance. In 1924, therefore, he resigned from his New York association to take the presidency and active management of it. He returned to the home of his youth with a great deal of enthusiasm and applied himself so diligently to his task that the earnings of the corporation which he now heads have shown a consistent increase since.

He is a tireless man of great energy, and is incessantly active in community work. Those close to him say that he throws his whole heart into each new enterprise which he undertakes, and that he constantly is adding new business interests without giving up any old ones. He has no hobby and is methodical in his business habits. He rises at seven each morning and reaches his office at eight. His home is one mile from his office, and almost invariably he walks both ways. He is in love with his native town, and it might well be said that Greenfield is his hobby.

At present he is director of the First National bank, a trustee of the Franklin Savings institution, a director of the Greenfield Electric Light & Power Co., and a director of the Goodell-Pratt Co., all of Greenfield, and a director of several other companies outside that city.

Colonel Payne is a great traveler. He skips around the country quickly, and with ease, in the interests of his business. He is in Chicago one day and Buffalo the next, and is on familiar terms with nearly all of his customers. He is known as a natural born salesman as well as a banker. Although proud of his New England association, he is essentially cosmopolitan in his outlook on life.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

GEORGE R. McDERMOTT, assistant chief engineer of the Illinois Steel Co., has become vice president and general manager of the Chapman-Stein Co., Mt. Vernon, O., thus relieving N. L. Daney, formerly general manager, to give more of his time to the C. & G. Cooper Co., affiliated organization at Mt. Vernon, of which he is a director and treasurer. Mr. Daney will continue as secretary and treasurer of the Chapman-Stein Co. Mr. McDermott was graduated from Cornell university in mechanical engineering in 1905, then served an apprenticeship with the General Electric Co., specializing on steam turbines. He afterwards returned to Cornell university for advanced work, during which time he instructed in thermodynamics in the college of engineering. Later he became associated with Westinghouse, Church, Kerr & Co., now Dwight P. Robinson Co., New York, as a field engineer. He has been employed since 1913 by the Illinois Steel Co., South works, where he held the positions of steam engineer and later assistant chief engineer.

Mr. McDermott has been active in a number of the technical societies, notably the Association of Iron and Steel Electrical Engineers, combustion division, and the American Society of Mechanical Engineers. Probably his greatest contribution to technical literature was his paper entitled "Thermal Efficiency and Heat Balance of an Open-Hearth Furnace", which was presented jointly by Mr. McDermott and C. L. Kinney Jr. before the American Iron and Steel institute and was awarded the Sir Robert Hadfield prize, given by the American Institute of Mining and Metallurgical Engineers.

* * *

C. L. O. Graul, assistant to the vice president of the Semet-Solvay Co., New York, has resigned.

* * *

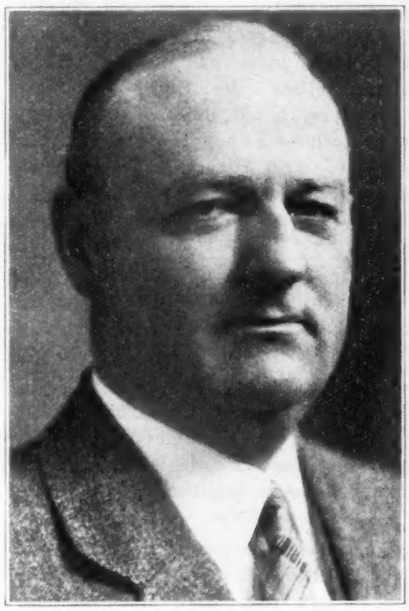
William C. Grolbert, of the Grolbert Furnace & Sheet Metal Co., Akron, O., has been elected a director of the Akron board of trade.

* * *

Jerome Alexander of New York has been retained by the Vanadium Corp. of America, New York, as consulting chemist and chemical engineer. Mr. Alexander, before devoting himself to consulting work, was engaged for 25 years in manufacturing and business, devoting much of his spare time to research.

* * *

T. F. Schlade, formerly vice president of the Federal Radiator Co., Zanesville, O., has severed his connection with that company.



GEORGE R. McDERMOTT

* * *

Sol Einstein, chief engineer, Cincinnati Milling Machine Co., Cincinnati, has sailed for England to study conditions in the machinery industries.

* * *

C. M. Higbie, Detroit, has been elected a director of the Reo Motor Car Co., Lansing, Mich. Officers and other directors have been re-elected.

* * *

O. B. Iles, head of the International Machine Tool Co., Indianapolis, recently was elected a director of the Indianapolis chamber of commerce, of which he is a past president.

* * *

W. P. Kirk, formerly sales manager of Pratt & Whitney Co., New York, has been appointed general sales manager of Niles-Bement-Pond Co., that city, to have charge of domestic divisions as announced briefly last week. H. F. Welsh, sales manager of the Niles Tool Works, Hamilton, O., has been placed in charge of sales in the New York district. William Hunter of the Philadelphia office, has been placed in charge of sales in that district.

* * *

Harry B. Harrison, president of the Harrison Engineering & Construction Co., Buffalo, has been elected a director of the Community National bank, of that city.

* * *

Arthur G. Hough, president and treasurer of the Wiard Plow Co., Batavia, N. Y., has been reappointed a director of the Federal Reserve bank board of western New York.

* * *

Otto Miller of Hayden Miller & Co., has been elected a director of the Otis Steel Co., Cleveland, succeeding Charles L. Bradley, president of the Cleveland Union Terminals Co., resigned.

* * *

A. R. Hauschel, European manager of the J. I. Case Threshing Machine Co., Racine, Wis., has been made director of foreign sales, filling the vacancy caused by the recent death of W. W. Ramsay.

* * *

J. L. Wiley, formerly librarian and translator for the Solvay Process Co., has joined the staff of Arthur D. Little Inc., Cambridge, Mass., chemist and engineer, and will do similar work in his new connection.

* * *

Francis A. Emmons, sales manager of the Foote Bros. Gear & Machine Co., Chicago, has been made a director of the Power Transmission association and a member of the merchandising advisory committee.

* * *

G. C. Pratt and W. F. Hosford have been elected vice presidents of the Western Electric Co., New York. Mr. Pratt, who has been general attorney, will have charge of the legal and patent offices as general counsel. Mr. Hosford, also elected a director, formerly controller of manufacture, will be in charge of all manufacturing. J. E. Otterson, formerly vice president and general manager of the Electrical Research Products Inc., a subsidiary

of Western Electric Co., has been elected president of the subsidiary. Whitford Drake has been elected vice president and a director.

* * *

Frank E. Artz has been appointed Chicago district sales representative for the General Mfg. Co., Detroit, manufacturer of power presses. His offices will be at 23 South Jefferson street, Chicago.

* * *

Louis J. Schneider, formerly associated with the Clark Equipment Co., and the C. G. Spring & Bumper Co., Detroit, has been appointed sales manager of the Harrison Radiator Corp., with headquarters in Detroit.

* * *

Samuel Wilson Parr, professor emeritus of industrial chemistry at the University of Illinois, Champaign, Ill., has been elected president of the American Chemical society, chosen by a mail ballot.

* * *

W. G. Guthrie, factory and production manager of the Peerless Motor Car Corp., Cleveland, has resigned to become associated with General Motors Export Co. as regional production manager for the European region. He will sail for London, Eng., Jan. 15.

* * *

R. G. Manning, engineer of the Ambridge, Pa., plant of the American Bridge Co., New York, has resigned to be an active vice president of the Ambridge Savings & Trust Co., of which he has been a director since 1909. He was elected a vice president in 1918, and has been engineer of the Bridge company since 1906.

* * *

F. M. Kimball has been made advisory manager and J. E. N. Hume, manager of mining and steel mill sales, has been made manager of a newly-established motor division of the General Electric Co., Schenectady, N. Y.

K. H. Runkle has been appointed to succeed Mr. Hume as mining and steel mill sales manager.

* * *

R. F. Schuachardt, electrical engineer with the Commonwealth Edison Co., Chicago, has been named by the nominating committee of the American Institute of Electrical Engineers for president of that organization in 1928. Mr. Schuachardt has been with the Commonwealth Edison Co. and its predecessors since 1898. He has long been active in the affairs of the institute and has held several important posts.

* * *

George P. Torrence has been appointed vice president of the Link-Belt Co., Chicago, with headquarters at Indianapolis, in charge of sales and operations in that city. George L. Morehead, Philadelphia, has been made a vice president in charge of eastern operations and sales. Frank B. Caldwell has been made vice president in charge of the Chicago plant and sales office, and W. C. Carter has been appointed vice president in charge of production at all plants, with headquarters in Chicago.

Obituaries

WILLIAM G. EATON, 55, senior member of Eaton, Rhodes & Co., Cincinnati, dealer in pig iron, coal and coke, died in that city Dec. 21. Mr. Eaton in 1907 associated with Frank R. Rhodes and organized the company which now has branch offices in many cities. Mr. Eaton was born in Yonkers, N. Y., and went to Cincinnati when a boy. He had been associated with Hickman, Williams & Co. until he organized his own company. Mr. Eaton's home was in Covington, Ky.

* * *

Emil F. Christoffel, 65, manufacturer of boiler pipe cleaners, died at his home in Brooklyn, N. Y., Dec. 17.

* * *

Joseph S. Mitchell, department head of the Sullivan Machinery Co., Chicago, died Dec. 22. He was a specialist on diamond drilling.

* * *

J. Walter Dickson, president of J. W. Dickson & Co., Pittsburgh, pig iron, alloys and fuel dealers, died Dec. 20 in that city.

* * *

Rudolph R. Harting, 56, formerly secretary and treasurer of the Lexington Hydraulic & Mfg. Co., Lexington, Ky., died Dec. 17.

* * *

K. L. Strickland, 57, erecting manager for the western division of the American Bridge Co., Pittsburgh, died at his home in Chicago recently.

* * *

Axel Hilmer Nilson, president and treasurer of the A. H. Nilson Machine Co., Bridgeport, Conn., died Dec. 12.

* * *

Charles Miller, president of the General Manifold & Printing Co., chairman of the board of the American Steel Foundries and former president of the Galena Signal Oil Co., died at Franklin, Pa., Dec. 20.

* * *

Emil Pollak, 82, founder of the Pollak Steel Co., Cincinnati, died Dec. 25 at his home in Cincinnati. Mr. Pollak became chairman of the board in 1923. He was a member of the board of trustees of the University of Cincinnati.

* * *

Andrew Jackson Tucker, 69, for many years president and treasurer of the Cheney Bigelow Wire Works, Springfield, Mass., died at his home in that city after a brief illness. He was a native of Gardner, Mass., but went to Springfield in 1877 to enter the employ of the Cheney Bigelow Works. He retired as president about a month ago and was made a member of the board of directors.

* * *

Blake B. Halladay, manager in Australia of the Canada Cycle & Motor Co., died in that country Dec. 17. Mr. Halladay was born in Elgin, Ont., and went to Winnipeg, Man., in his youth. He was graduated with high honors from Wesley college, Winnipeg. For 20 years he was connected with the Canada Cycle company, first as manager of the Winnipeg branch, later as sales manager in Toronto, and finally as manager in Australia.

* * *

John White, 79, a prominent manufacturer of London, Ont., died in that city Dec. 18. He was born in Devonshire, Eng., and came to Canada as a young man. After engaging in business as a blacksmith for some years he established the London Bolt Works, and in 1903 in partnership with the late Sir Adam Beck founded the London Rolling Mills, retaining the presidency of that company until two years ago.

* * *

Harvey Hubbell, 68, president and treasurer of Harvey Hubbell Inc., Bridgeport, Conn., maker of electrical supplies, died at his home in that city, Dec. 17. Mr. Hubbell was born in Brooklyn, N. Y., and educated in Connecticut and New York schools. He began on a small scale, the manufacture of one or two patented articles of his own invention in 1888, in Bridgeport, and later this developed into the present manufacturing company.

German Award "Compulsory"

Government Reported Ready To Enforce Eight-Hour Day and Wage Increase —Both Sides Dissatisfied—French Steel Exporters Obtaining Better Prices—Holidays Check Business in Great Britain

European Headquarters,
IRON TRADE REVIEW,
Caxton House, Westminster, S. W.1

LONDON, Dec. 27.—German steelmakers and their employes have refused to submit voluntarily to the award made a week ago by a government arbitrator in an attempt to settle their dispute. Both sides object to certain features of the award, which grants the workers the eight-hour day and increases their hourly wage rate, though not to the extent demanded. A dispatch from Berlin today states the terms laid down by the arbitrator will be made compulsory. IRON TRADE REVIEW'S correspondent at Brussels, Belgium, reports that fears of a German lockout largely are discounted.

The market in Belgium is firm and the wire rod syndicate is expected to raise prices. Paris reports market conditions are improving, and that higher prices are being obtained on export orders owing to the uncertainty of German deliveries due to labor difficulties of recent origin.

The holidays checked iron and steel business in Great Britain. Middlesbrough pig iron has been sold in larger quantities for domestic consumption, but exports are smaller. Export sales of east coast hematite have increased, and larger sales also are being made to domestic consumers who formerly used continental material. Demand for galvanized sheets is improving.

British Steel Trading Pauses at End of Year

Office of IRON TRADE REVIEW,
Prince's Chambers, Corporation St.

BIRMINGHAM, Eng., Dec. 15.—(*European Staff Service*)—With their minds on stock-taking, users of pig iron are not disposed to be enterprising in buying material. Purchases are restricted to requirements. The reduction of 2s 6d ($0.60) in Middlesbrough No. 3 iron is believed to have had a healthy influence, British users regarding the preference lately given the foreigner as unfair. One effect of the reduction, however, is that pressure will be brought to bear upon Derbyshire furnacemen to concede a corresponding reduction to restore the relationship between Derbyshire and Middlesbrough iron.

Sterling $4.87

A new development is a selling agency established by Middlesbrough ironmasters to dispose of their output in Glasgow. The selling business will be in the hands of a Glasgow firm, J. & A. McMorland. It is hoped the arrangement will increase ability to compete with foreign pig iron, which still comes into the port of Glasgow.

Structural undertakings in hand represent only a small tonnage but much work is pending from the state railways of India and in connection with South African railways, which it is hoped will yield fair tonnages.

Continental prices have hardened, billets now costing £5 7s 6d ($26.16) £5 10s ($26.78), steel bars £6

The price of tin plate remains at 17s 9d ($4.33) with a fair volume of business. Mills are running at about 75 per cent capacity. As it is in- ($29.22) and iron £5 19s ($28.98).

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, December 26	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$15.86	3 5 0*	$15.13	3 2 0	$15.13	3 2 0	$14.64	3 0 0
Basic	.....	.....	14.64	3 0 0	14.64	3 0 0	14.64	3 0 0
Basic-bessemer	17.69	3 12 0†	14.40	2 19 0	14.40	2 19 0	14.64	3 0 0
Hematite, Phosphorus 0.02-0.05	17.45	3 11 6	21.87	555*	.....	.....	17.08	3 10 0
SEMIFINISHED STEEL								
Billets	$28.06	5 15 0	$21.23	4 7 0	$21.23	4 7 0	$21.23	4 7 0
Wire rods	47.58	9 15 0	26.84	5 10 0	26.74	5 10 0	26.84	5 10 0
FINISHED STEEL								
Standard rails	$37.82	7 15 0	$31.11	6 7 6	$31.11	6 7 6	$31.11	6 7 6
Merchant bars	1.58c	7 5 0	1.08c	4 18 6	1.08c	4 18 6	1.06c	4 16 0
Structural shapes	1.55c	7 2 6	1.00c	4 8 0	1.00c	4 8 0	1.01c	4 12 0
Plates, ship, bridge and tank	1.72c	7 17 6	1.32c	6 0 0	1.32c	6 0 0	1.49c	6 15 0
Sheets, black, 24 gage	2.40c	11 0 0	2.20c	10 0 0	2.20c	10 0 0	2.86c	13 0 0
Sheets, galvanized, 24 gage, corrugated	2.94c	13 0 0	3.30c	15 0 0	3.25c	14 15 0	3.74c	17 0 0
Bands and strips	2.51c	11 10 0	1.29c	5 17 6	1.29c	5 17 6	1.49c	6 15 0
Plain wire, base	2.13c	9 15 0	1.54c	7 0 0	1.54c	7 0 0	1.60c	7 5 0
Galvanized wire, base	3.05c	14 0 0	1.95c	8 17 6	1.95c	8 17 6	2.09c	9 10 0
Wire nails, base	2.83c	13 0 0	1.60c	7 5 0	1.60c	7 5 0	1.76c	8 0 0
Tin plate, base box 108 pounds	$ 4.33	0 17 9	.....	.....	.....	.....	$ 6.83	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$15.86	3 5 0	$16.55	420(2)	$16.52	590	$17.02	74
Basic pig iron	.....	.....	17.93	455(1)	15.68	560	19.32	84
Furnace coke	3.17	0 13 0	6.11	155	5.18	185	4.95	21.50
Billets	28.06	5 15 0	19.31	490	22.12	790	25.88	112.50
Standard rails	1.74c	8 0 0	1.36c	755	1.43c	1,100	1.46c	140
Merchant bars	1.64c	7 10 0	1.00c	555	1.12c	865	1.40c	134
Shapes	1.66c	7 12 6	1.00c	530	1.11c	855	1.37c	131
Plates, ship, bridge and tank	1.83c	8 7 6	1.29c	715	1.40c	1.080	1.55c	149
Sheets, black, 24 gage	2.51c	11 10 0	2.39c	1,325	2.21c	1,700	2.29c	220
Sheets, galvanized 24 gage, corrugated	2.85c	13 2 6	3.24c	1,800	3.71c	2,850	3.65c	350
Plain wire	2.13c	9 15 0	1.62c	900	1.82c	1,400	2.03c	195
Bands and Strips	2.29c	10 10 0	1.21c	670	1.35c	1,040	1.61c	154

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £0 13s 0d ($3.17) f. o. b. Ferromanganese £18 11s 3d ($90.59) delivered Atlantic seaboard, duty paid. German ferromanganese £15 0s 0d ($73.20) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

tended to carry restriction of output still further into the new year it is hardly likely that this working arrangement will be maintained.

Galvanized sheets are steady at £13 2s 6d ($63.91) but there is some cutting of prices in the Glasgow area. There is good demand for black sheets for motor building and various requirements from the stamping trade.

In wrought iron the chief activity is in marked bars which remain £13 ($63.31) per ton. In Scotland bar iron makers have reduced their iron 10s ($2.43) per ton, but there is not much demand and the call for rerolled material also is not large.

Makers of west coast iron have found it necessary to reduce price 2s 6d ($0.60) per ton, making the new figure £3 15s ($18.25). The output of the eleven furnaces in blast in the North Lancashire and Cumberland district is being fully absorbed and stocks are being reduced. The Midlands is taking a fair tonnage and Scotland is a good buyer of this high class material. Improving inquiries are reported from the United States.

The steel industry is well employed at Barrow and Workington and the mills have enough to occupy them until the end of the year. Vickers has good shipbuilding orders which promise to give full employment to its staff of 11,000 to 12,000 workpeople.

Luxemburg Trade Steady

Brussels, Dec. 15.—(*European Staff Service*)—Exports of steel from the Belgo-Luxemburg economic union in September were less than in August. Exports of pig iron in September were greater than in August. The principal item of exports of steel was blooms and billets, the tonnage shipped being 77,005 tons, of which 51,781 tons went to Great Britain.

Imports of pig iron into Belgium and Luxemburg in September were slightly less than in August. Imports of steel in September amounted to 27,726 metric tons, as compared with 27,824 tons in August.

British Profits Small

London, Dec. 15.—(*European Staff Service*)—Due to the strike and continued trade depression, the accounts of Baldwins, Ltd., make a poor showing. The trading profit, being much reduced, is insufficient to meet interest on the debenture stock and sinking fund provisions, amounting to £225.000. However, the sum carried forward from the preceding year enables the company to meet its obligations. At present the concern is being reorganized, and its interests in certain subsidiaries are being liquidated. Steps are being taken to dispose of Baldwins Canadian Steel Corp. and the Mannesmannrohren-Werke have taken over from the company a shareholding in the British Mannesmann Tube Co., which is being reconstructed.

The report of Dorman, Long, & Co., Ltd., shows that although considerable losses were incurred during the first half of the financial year, due to the coal dispute, profits in the second half were sufficient to cover these losses and to leave a balance of profit on the year's working of £273.338. A credit balance of £2107 is carried forward. In August last a separate banking account was opened for the bridge department. The reports of the company's engineers on all bridge contracts are satisfactory. No profit on bridges under construction is included in this year's account.

Belgian Iron at Height

Brussels, Dec. 25. — (*European Staff Service*)—During October Belgian furnaces reached their highest output of the year. October output of steel ingots and castings was composed of 302,690 tons of ingots and 9370 tons of steel castings. October was the record month for the production of furnace coke. Figures follow:

Mon. ave.	Coke	Act. Furn.	Pig iron	Steel ingots and castings	Finished steel
1913	294,000	....	207,055	205,550	154,820
1924	351,380	....	236,995	239,585	177,050
1925	342,645	....	211,875	212,380	164,940
1926	413,000	....	283,270	281,160	231,810
1927—					
Jan.	435,820	55	316,430	312,590	259,040
Feb.	393,870	55	292,620	296,830	245,230
Mar.	432,880	55	314,340	314,625	269,740
Apr.	440,100	54	309,920	301,070	237,700
May	461,050	54	318,790	321,140	252,180
June	447,690	54	302,010	299,770	242,230
July	461,810	55	319,650	314,140	246,830
Aug.	469,420	55	316,690	325,690	254,880
Sept.	455,800	55	308,800	289,870	257,190
Oct.	471,230	55	322,230	312,060	264,410

French Exports Lose

Paris, Dec. 15.—(*European Staff Service*)—Exports of principal steel products from France in September were 365,200 metric tons, compared with 367,473 tons in August. Imports were 3901 metric tons against 4979 tons in August. Figures follow:

Mon. ave.	IMPORTS Pig iron	IMPORTS Steel	EXPORTS Pig iron	EXPORTS Steel
1924	3,540	56,780	63,900	187,380
1925	2,693	11,703	58,855	272,270
1926	1,990	11,840	58,545	256,050
1927				
Jan.	1,153	6,412	82,286	343,378
Feb.	2,536	8,073	69,370	382,368
March	1,730	9,199	65,906	377,779
April	1,720	8,043	70,252	410,286
May	3,978	7,811	85,844	345,584
June	6,129	6,941	75,119	330,151
July	5,083	6,122	68,454	351,754
August	3,454	4,979	74,566	367,473
Sept.	2,132	3,901	60,797	365,200

Less French Ore Mined

Paris, Dec. 15.—(*European Staff Service*)—Output of iron ore from French mines in September was 3,871,-219 metric tons, against 3,902,181 tons, the highest mark, reached in August. Figures follow:

Mon. ave.	Production	Stocks at end of month
1924	2,416,000	.....
1925	2,978,400	.....
1926	3,290,000	.....
1927		
Jan.	3,799,796	1,907,518
Feb.	3,652,796	2,003,139
March	3,029,680	2,190,352
April	3,604,453	2,195,077
May	3,699,720	2,168,807
June	.....	.....
July	3,658,036	.....
August	3,902,181	2 222,422
September	3 871,219	2,300,988

Homecourt Makes Profit

Paris, Dec. 19.—(*European Staff Service*)—Stockholders of the Acieries de la Marine et D'Homecourt have held their annual general meeting. Net profit for the year 1926-27 was 14,419,988 francs ($570,000), about the same as the preceding year. The Saint-Chamond plant, in the center of France, has filled orders for locomotives and ordnance work for foreign governments. Orders have been received from the navy for a new range-finding apparatus invented by an engineer of the company. Increases in the price of fuel and scrap, specially felt in the Saint-Chamond district, has rendered difficult the operation of the plate and sheet mills, and it is planned to transfer these mills to Homecourt.

At the Homecourt plant six blast furnace stacks have been operating since November, 1926. The rolling mill works have been working to capacity and the 10-ton blooming mill was started at the end of the financial year. Reconstruction of the plant will be completed when the seventh blast furnace stack has been completed. The combined output of the Homecourt plant and the Micheville plant, associated with it, for the financial year 1926-27 was 717,532 metric tons of pig iron and 606,484 tons of steel. The concern is interested in the Usines de Rombas et de Differdange. Rombas distributed a dividend of 10 per cent for 1926, but these works are subject to the conditions of the French market and now feel the industrial depression, whereas the Differdange works, more connected with the Belgian market, give better results.

Baldwins Meets Losses

London, Dec. 19.—(*European Staff Service*)—Stockholders of Baldwins, Ltd., held their twenty-fifth annual meeting in Birmingham. In moving the adoption of the report, Colonel Sir W. Charles Wright, chairman of the board of directors, said that there was a deficit on the year's trading of £129,970 ($630,000). The arrears of preference dividend now amount to £220,461 ($1,090,000). An advisory committee is investigating the affairs of the company and has advised the board of directors that the reduced earnings of recent years is attributable chiefly to extensions carried out during the war, and to the purchase of properties in the period immediately following the war.

In large measure the losses, principally incurred by the collieries, blast furnaces, and heavy steel departments, have had to be met by excess profits duty recoveries and transfers from reserves, and also have seriously reduced the profits made by other branches of the business. Attention of the committee now is engaged in a scheme of re-organization. Sir W. Charles Wright said that the coal stoppage had brought the company's trade almost to a standstill, and cost them about £300,000 (1½ million dollars). In addition, prices have considerably fallen, and even at present low rates coal is difficult to market. There are, however, signs of a slight improvement in some directions.

CONSTRUCTION *and* ENTERPRISE

Concise Timely Business Building Opportunities from Field of Industry

North Atlantic

WILMINGTON, DEL.—Dravo Contracting Co., Pittsburgh, has started work on the new barge building plant being constructed here.

WASHINGTON—Bureau of supplies and accounts, navy department, is inquiring for welders and welding sets, steel boiler tubes, condenser tubes and other tubing.

BALTIMORE—General Garage Mfg. Co., 23 Norris street, C. W. Shafer, manager, is building a plant 50 x 75 feet on North Aisquith street.

BOSTON—Chickering & Sons, 791 Tremont street, maker of pianos, mechanisms, etc., plans to build an addition, 65 x 95 feet, to its power plant.

HOBOKEN, N. J.—Continental Baking Co., 740 Clinton street, will install ovens, power equipment and conveying machinery in its proposed new bakery.

HOBOKEN, N. J.—Atlas Welding Co. Inc. has been incorporated with $10,000 capital by Gliedt & Weincke, Union City, N. J., attorneys.

CAMDEN, N. J.—Camden Rail & Harbor Terminal Corp. will build three cold storage buildings. Moores & Dunford, 110 East Forty-second street, New York, are architects and engineers. Material handling equipment wil be required.

JERSEY CITY, N. J.—Moran Cutler Co. Inc. has been incorporated with $50,000 capital to manufacture and deal in oil burners by David Barnett, New York, attorney.

LINDEN, N. J.—Structural Gypsum Co., 53 Park Place, New York, will build a 1-story plant here.

NEWARK, N. J.—Acme Bar Mfg. Co. has been incorporated with $50,000 capital by Warner & Warner, Newark, attorneys.

NEWARK, N. J.—Roman Ornamental Metal Co., 39 South Sixth street, has leased a part of the building at 119 Sussex avenue and contemplates expansion.

NEWARK, N. J.—Oschwald Construction Co., 854 Clinton avenue, has been awarded the contract for a 3-story mechanical and woodworking shop, to be built for the board of education, 19 Winans street, East Orange.

PERTH AMBOY, N. J.—New Jersey Terra Cotta Co., M. McAustin in charge, contemplates building a plant addition at 2 Catherine street.

ALBANY, N. Y.—Anti-Corrosive Metal Products Co. has been incorporated with $10,000 capital by J. F. O'Brien, Albany, attorney.

BROOKLYN, N. Y.—Hollan & Son has been incorporated with 150 shares no par value to deal in metals by Joseph Demov, 1431 Broadway, New York, attorneys.

BUFFALO—Hecker-Jones-Jewell Milling Co., New York, will build a new grain elevator, 78 x 552 feet, and will require conveying machinery and other equipment.

LONG ISLAND, N. Y.—Long Island Lighting Co. has awarded the structural steel contract for a boiler house to Lehigh Structural Steel Co.

LONG ISLAND CITY, N. Y.—Autosales Corp., Thirteenth and Van Alst avenue, has purchased controlling interest in Automatic Machine Co. Inc., Automatic Shoe Shiner Corp. and Cigarette Vending Machine Co. Inc., manufacturers of vending machines, and expansion is contemplated.

NEW YORK—Horner Steel Furniture Co. has been incorporated with 100 shares no par value by Epstein & Bros., 2 Rector street.

NEW YORK—Elite Home Electric Mixer Co. has been incorporated with $20,000 capital by B. Fenster, 1133 Broadway, attorney.

NEW YORK—Riverside Scrap Iron & Metal Co. has been incorporated with $10,000 capital by M. Altschuler, 501 East 181st street.

NEW YORK—Postage Machine Corp. has been incorporated with $5000 capital by F. R. Rich, 36 West Forty-fourth street, attorney.

NEW YORK—Cole Switchboard Co. has been incorporated with 200 shares no par value by M. Zaliels, 120 Broadway, attorney.

NEW YORK—Metal Artcraft Fixture Co. has been incorporated with $10,000 capital by B. J. Becker, 305 Broadway, attorney.

NEW YORK—Electric Bilt Corp. has been incorporated with $100,000 capital to manufacture radios by B. I. Schlessel, 1440 Broadway, attorney.

NEW YORK—A. Crusher & Pulverizer Co. has been incorporated with $50,000 capital to manufacture and deal in machinery by A. Bunnell, 2 Lafayette street, attorney.

NEW YORK—Atlantic Gypsum Products Co., 40 Rector street, J. Clifford Woodhull, president, will build a 6-story plant. H. J. Brown, 35 Doane street, Boston, is architect.

NEW YORK—Photoself Machine Corp. has been incorporated with $100,000 capital by Richards, Smyth & Conway, 32 Court street, Brooklyn, attorneys.

NEW YORK—John Steel Corp. has been incorporated with $10,000 capital to manufacture and deal in cigar cutters by G. S. P. Kleeberg, 66 Broadway, attorney.

NEW YORK—Philip Wirth has been incorporated with $50,000 capital to manufacture filtering machines by D. F. Richter, 302 Broadway, attorney.

NEW YORK—Gabriel Teen Co. has been incorporated with 1000 shares no par value stock to manufacture and deal in permanent waving machines by Hoffman & Gelder, Chicago, attorneys.

NEW YORK—Kent Garage Investing Corp., 350 Madison avenue, will soon start construction of a 24-story service, repair and garage building, with electric installation for automatic parking of cars, mechanical shop, etc.

NEW YORK—New York Edison Co., Irving place and Fifteenth street, plans to build a power substation and distributing plant at Dey and Washington streets and at Tibbetts avenue and 238th street.

NEW YORK—Robert Beyer Corp. has been incorporated with 10,000 shares no par value stock to manufacture machinery by W. F. McCormick, Bill Drafting commission office, attorney.

NEW YORK—Carbo Copper has been incorporated with 200 shares no par value stock to manufacture and deal in iron and steel products by A. P. Blanek, 233 Broadway, attorney.

POTSDAM, N. Y.—Kennall Patents has been incorporated with $150,000 capital to manufacture tools by F. J. Wagner, Malone, N. Y., attorney.

ROCHESTER, N. Y.—Empire Sprinkling Co., 286 Main street West, has leased the former government munition plant and will move its present plant equipment there.

BETHLEHEM, PA.—Lehigh university, Dr C. Russ Richards, president, will build a 3-story electrical and mechanical laboratory. Wisscher & Burley, 51 East Forty-second street, New York, are architects.

DANVILLE, PA.—Danville Iron & Steel Co. plans to bulid a 1-story addition.

HOMESTEAD, PA.—Carnegie Steel Co., W. G. Clyde, president, will build a locomotive and general repair shop. S. Dillon, Carnegie building, is engineer.

LANSDALE, PA.—A machine shop owned by George Clauser was damaged badly by fire recently.

MONESSEN, PA.—Pittsburgh Steel Co., manufacturer of wire-fencing nails, had its plant damaged by a recent fire.

PHILADELPHIA—Preliminary plans are being prepared for a mill addition for the

(*Continued on Page* 1649)

Resale News

Geneva Cutlery Co., Geneva, N. Y., manufacturer of cutlery and razors, has filed a petition in voluntary bankruptcy, placing its liabilities at $210,129 and assets at $182,528.

* * *

Plant of the Roberts Machine Co., Jamestown, N. Y., has been bought by Wycliffe L. Clark, of the Weber Knapp Co., and A. Louis Minsker, head of a wrecking firm. Real estate, fixtures and machinery are included in the sale. Disposition of the plant has not been announced by the buyers.

Machinery

December Business Closing but Little Better Than That of November—Real Upturn Not Anticipated Before Middle of January

BUSINESS in machine tools and shop equipment has been somewhat spotty during the close of December, making it difficult to determine whether the turn in the road has been reached. Manufacturers find little difference between the sales of November and December and this is the opinion of some dealers. Other machinery houses have felt a distinct improvement and state that the curve is rising in much the same fashion as during the last month of 1925. Generally speaking, the real upturn is not anticipated before the middle of January. Price advances on various lines still are noted. Norfolk & Western now is awarding formal orders on its list of over 60 tools. Westinghouse Electric & Mfg. Co. is expected to add to its list of 22 items.

New York, Dec. 27.—Machine tool business is being retarded by seasonal influences, with no particular improvement expected much before the middle of next month, at which time inventory taking should be largely completed. At present the principal development is issuance of formal contracts by the Norfolk & Western against its list of more than 60 machine tools. All things considered, December has been a fairly good one for machinery sellers. Advance in prices on several important descriptions of machines has undoubtedly had a stimulating influence. Crane buying is slack, with few outstanding lists being figured. The General Electric list of 13 cranes, pending for some time, is perhaps the largest.

Pittsburgh, Dec. 27.—Within a few days after issuance of its inquiry, Pittsburgh Steel Products Co. purchased all but one or two items on its list to replace machines lost in a recent fire. Westinghouse Electric & Mfg. Co. undoubtedly will add to its list recently issued, since the present one involves but 22 items, 12 of which are machines. No drills or lathes are included, but three milling machines, one metal cutting machine, one shaper, one planer, and a large horizontal boring mill and two saws are wanted. Other inquiries involving one, two or three tools at a time are fairly numerous for this season. Crane inquiries are scarce, as are awards. Wheeling Steel Corp. will probably buy machine tools, strip mill machinery, and cranes for its contemplated expansion at Wheeling.

Cleveland, Dec. 27.—Business is of a spotty nature in this territory. Some houses find sales appreciably improved while others find little difference between the order sheets of November and December. Manufacturers report activity at about the same rate as in the previous month. Real improvement in the situation is not looked for before the middle of January, but all are optimistic over the prospects for the first quarter. Because of the double holidays no marked change in activity is expected this week.

Chicago, Dec. 27.—Indications are the volume of machine tool sales in December will be approximately equal to November. Buying recently has been in scattered lots and single-tool purchases, largely from industrial users, but the tendency now is to hold up contemplated purchases until after Jan. 1. The Missouri Pacific is expected to start buying before the end of the year on the list it issued a week ago. Part of this inquiry is for the Texas & Pacific lines. The most important industrial inquiry now before the trade comes from a road machinery builder in Milwaukee, who is asking bids on about 25 tools, including general machine shop equipment. This prospective buyer is offering practically all of its present machine shop equipment in trade. Considerable interest is shown in this offering. Some special tools have been sold in the past week. Inquiry for used tools continues.

Crane Orders Drop Again During November

Crane orders again declined in November, according to the regular monthly statement of the Electric Overhead Crane institute. The number of cranes involved dropped from 70 in October to 59. From a standpoint of capacity there was a reduction from 1145½ tons to 902½ tons, and from the standpoint of dollar value, a reduction from $565,972.44 to $524,935.16. While the showing was the poorest from the standpoint of the number of cranes involved in several months, it was better in point of value than for August, when orders involving 105 cranes, only totaled $483,029.

Unfilled orders in November involved 225 cranes, as compared with 255 cranes in the preceding month. The capacity of these unfilled orders amounted to 3849¼ tons as against 4308¾ tons in October and the value $1,974,764.66, as against $2,117,060.14.

Shipments also showed a reduction, amounting to 88 cranes, as against 111 in October. The total tonnage capacity was 1150, compared with 1159½ tons; and the total dollar value $637,045.20, as against $764,294.78.

Demonstrates New Steelmaking Process

A new steelmaking process recently was demonstrated at the Sheffield, England, plant of Edgar Allen & Co. A high-frequency alternating current electric furnace is used, the crucible being surrounded by 1 inch of insulation around which a water-cooled coil is wound. The crucible charge of 450 pounds is melted in approximately an hour. The advantages of the process include purity of product, quick melting time, thorough mixing, homogeneity of ingots, heat closely controlled and intermittent furnace operation.

Acquires Benwood Plant

Wheeling Steel Corp., Wheeling, W. Va., has purchased the Riverside works of the National Tube Co., located at Benwood, W. Va., immediately adjacent to Wheeling on the south. While the plant includes two blast furnaces, 120 by-product coke ovens, two bessemer converters, a 32-inch blooming mill, five skelp mills and five buttweld and two lapweld pipe mills the acquisition does not cover a portion of the steel mill and the skelp and tubemaking equipment nor is the coke plant included. President I. M. Scott states the upper stack will be placed in blast immediately in order to furnish hot metal for the Benwood skelp and tube mills.

Will Modernize Holdings

A program of modernization at the Alabama City works of the Gulf States Steel Co., Alabama City, Ala., has been announced by L. E. Geohegan, vice president and general manager. Four 900-horsepower boilers with the necessary appurtenances, two 60,000-cubic foot per minute turbo blowers and electric generators of 10,000 kilowatt capacity will be installed and the drive for the rod mill will be electrified. The work will be executed by Dwight P. Robinson & Co., New York.

Will Install Coke Plant

Zenith Furnace Co., West Duluth, Minn., has awarded a contract to the Koppers Construction Co., Pittsburgh, for the erection of 41 Becker-type by-product coke ovens and a by-product plant. The ovens will have an annual carbonizing capacity of 350,000 tons of coal. Arthur G. McKee & Co., Cleveland has been engaged by the Zenith Furnace Co. as engineers in connection with the new dock, material handling plant, coke ovens and other construction, details of which were given on page 1427 of the Dec. 8 issue of IRON TRADE REVIEW.

Iron and Manganese Ores and Minerals

LAKE SUPERIOR ORES

Iron Ore

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 58 to 63 per cent	8.00 to 8.50
Copper free low phosphorus 58 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, alongside docks, Atlantic ports

Foreign manganiferous ore, 45 to 55 per cent iron and 6 to 8 per cent manganese	10.00 to 10.50
North African low phosphorus	nominal
Swedish foundry or basic, 65 per cent	9.00 to 9.50
Spanish and North African basic, 50 to 60 per cent	8.50 to 9.00
Newfoundland foundry, 55 per cent	9.00 to 9.50

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian	36 to 38 cents
Indian	36 to 38 cents
Caucasian, 53 to 55 per cent washed	38 to 40 cents

Fluorspar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$16.00
Washed gravel, imported duty paid eastern tidewater, per net ton	16.00 to 16.50

Construction and Enterprise

(*Continued from Page* 1647)

United Knitting Mills, 1025 Callowhill street. The Balling Co. is architect.

PHILADELPHIA—A contract has been awarded for a manufacturing building for the Gill-Birden Co., Amber and Tioga streets.

PHOENIXVILLE, PA.—John Funk of Kimberton, has purchased the Madco Foundry & Machine Co. The foundry building is 50 x 175 feet and there are also machine and pattern shops, as well as other buildings.

PROVIDENCE, R. I.—Rhode Island Fittings Co., Georgia avenue, maker of pipe fittings and other iron specialties, has awarded the general contract for a 1-story addition, 32 x 48 feet, to E. H. Bigney, 49 Weybosset street.

East Central

BLOOMINGTON, ILL.—Meadows Mfg. Co., maker of electrically operated washing machines, and operator of a foundry for castings for general trade, contemplates expansion.

CHICAGO—Richardson Rod & Reel Co., Sawyer street and Belmont avenue, will build an addition 62 x 119 feet.

CHICAGO—Mechanical Mfg. Co., Union Stock Yards, will build a machine shop, 81 x 85 feet.

CHICAGO—Callner Construction Co., 134 North La Salle street, will build a 1-story shop on South Park avenue, near Sixty-sixth street.

CHICAGO—Monarch Matrix & Stero Co., 511 South Dearborn street, has been incorporated with $10,000 capital to manufacture printing type, matrices, dies, etc., with Joseph Z. Willner, 1248 Otis building, correspondent.

DEKALB, ILL.—Illinois Northern Utility Co., L. G. Adams, engineer, contemplates building a plant.

PEORIA, ILL.—American Nut Lock Co., 709 South Washington street, has been incorporated with $100,000 capital to manufacture and deal in lock nuts with William J. Peck, Jefferson building, attorney.

RAMSEY, ILL.—Sphinx Electrical Mfg. Co. has been incorporated with $30,000 shares preferred and 5000 shares no par value stock to manufacture and deal in storage batteries, electrical appliances and machinery with Baird & Henske, 908 Paul Brown building, St. Louis, attorneys.

INDIANAPOLIS—Marmon Motor Car Co., which has been carrying out an expansion program, has much of its work completed. Plant No. 2 is being remodeled and will be used for production of motors.

LAFAYETTE, IND.—Fairfield Mfg. Co., maker of gears and cutters, has awarded the contract for a 1-story plant addition to W. C. Anderson, 109 South Twenty-eighth street.

MUNCIE, IND.—Warner Gear Co., maker of transmissions and differentials for automotive vehicles, is building an addition 145 x 180 feet to its present unit, which will enlarge the general manufacturing facilities. New machine tool equipment is being purchased. (Noted Dec. 8)

DETROIT—Detroit Machine Tool Co. has been incorporated with $25,000 capital by Harold W. Holmes, 1650 Balmoral drive, Detroit.

FLINT, MICH.—E. I. duPont de Nemours & Co., Flint, Mich., has awarded the general contract for a 2-story machine shop and experimental laboratory to the W. E. Wood Co., E. P. Smith building.

LANSING, MICH.—Central Tool & Die Co. has been incorporated with $50,000 capital to manufacture and deal in tools, dies and special machinery by J. Albert Baske, 507 Barnes avenue, Lansing.

PONTIAC, MICH.—Michigan Sheet Metal Works, 116 South Larch street, will build a 1-story plant addition.

AKRON, O.—General Instruments Co. has been incorporated with $30,000 capital by H. B. Bixler, R. D. McDowell and J. Fred Smith.

CINCINNATI—Taylor Engineering Co. has been incorporated with 100 shares no par value stock by George W. Martin, Ralph L. Taylor and William R. Young.

CINCINNATI—International Aircraft Corp. has been incorporated with 45,000 shares no par value and $200,000 shares preferred stock, by Clarence E. Ogden, H. G. Tildesley and Arthur H. Eward.

CLEVELAND—Metal Finishers Machine Co. has been incorporated with $5000 capital by Louis Schulte and F. G. Cyrex, Euclid-East Sixty-first building.

CLEVELAND—General Pump & Mfg. Co. Inc. has been incorporated with $50,000 capital by M. W. Manow, Society for Savings building, attorney.

MASSILLON, O.—Eaton Spring Co. plant and machinery was damaged by fire Dec. 20.

RAVENNA, O.—Byers Machine Co., manu-

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

First Quality	
Pennsylvania	$43.00 to 46.00
Ohio	43.00 to 46.00
Illinois	43.00 to 46.00
Kentucky	43.00 to 46.00
Missouri	43.00 to 46.00
Maryland	43.00 to 46.00
Georgia and Alabama	40.00 to 45.00
Second Quality	
Pennsylvania	35.00 to 38.00
Ohio	35.00 to 38.00
Illinois	35.00 to 38.00
Kentucky	35.00 to 38.00
Missouri	35.00 to 38.00
Maryland	35.00 to 38.00
Georgia and Alabama	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Joliet, Ill., and East Chicago, Ind.	52.00
Birmingham	51.00

MAGNESITE BRICK

Per Net Ton

9 x 4½ x 2½	65.00

MAGNESITE

Per Net Ton Chester, Pa. and Baltimore base

Dead-burned grain magnesite	40.00

CHROME BRICK

Per Net Ton Chester, Pa., and Baltimore base

9 x 4½ x 2½	45.00

Where Machinery Exports Went in October

	Lathes—Engine	Lathes—Turret	Lathes—Other	Drills—Vertical	Drills—Radial	Drills—Sensitive	Drills—Other	Gear Cutters	Planers	Shapers and Slotters	Metal sawing cutting	Milling knee column	Machines other	Pneumatic portable tools
Russia	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	6	207
France	1	2	.....	8	6	.....	1	5	.....	2	.....	18	12	295
Germany	2	3	.....	1	3	.....	2	2	.....	5	1	6	.....	68
Italy	.....	.....	.....	2	.....	.....	.....	1	.....	.....	.....	.....	5	60
Netherlands	1	1	2	.....	.....	1	.....	.....	.....	.....	10	.....	.....	1
Spain	.....	.....	.....	3	.....	.....	.....	.....	.....	.....	.....	1	.....	64
Sweden	.....	.....	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	1
United Kingdom	18	1	3	3	2	.....	7	19	.....	9	.....	2	4	519
Canada	21	1	12	8	5	.....	31	2	2	.....	3	6	3	165
Mexico	1	.....	.....	2	1	.....	.....	.....	.....	.....	.....	.....	.....	4
Cuba	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	11
Argentina	.....	1	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	29
Colombia	5	.....	.....	.....	.....	12	.....	.....	.....	.....	2	.....	2	15
Chile	1	.....	.....	2	.....	.....	.....	.....	.....	.....	1	.....	.....	9
Brazil	4	.....	2	.....	.....	.....	.....	.....	.....	2	.....	.....	1	26
Japan and Chosen	3	1	.....	1	.....	.....	11	.....	.....	.....	.....	.....	1	333
Philippine Islands	11	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....	.....	22
Australia	.....	1	.....	.....	.....	.....	1	.....	.....	3	.....	.....	.....	45
British South Africa	2	.....	.....	.....	.....	10	.....	.....	.....	1	.....	.....	.....	44
Venezuela	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Other countries	7	.....	6	3	.....	3	2	.....	.....	4	3	2	11	36
Total, Jan., 1927	36	8	21	23	7	31	25	21	3	38	31	56	28	1,335
February	53	21	56	35	3	40	49	7	7	10	12	30	21	1,362
March	44	15	35	56	18	58	266	62	2	49	60	11	27	1,498
April	61	15	27	20	8	61	54	29	3	40	20	22	46	.....
May	52	20	35	16	4	90	106	1	4	22	8	12	33	1,458
June	48	16	39	17	9	15	71	34	4	28	10	9	38	2,081
July	60	69	32	20	8	20	47	62	6	18	19	27	44	2,198
August	32	19	49	28	7	32	79	29	2	40	33	9	23	1,927
September	38	15	25	15	8	75	27	29	6	23	17	5	37	1,227
October	77	12	28	33	17	28	55	31	2	26	20	35	45	1,954

facturer of power shovels, contemplates extensive expansion which includes the purchase of the Massillon Power Shovel Co., Massillon, O.

Southern States

BIRMINGHAM, ALA.—General Metal Products Co. has been incorporated with $10,000 capital by C. F. Anderson, 4131 Crescent place.

BIRMINGHAM, ALA.—Birmingham Water Works contemplates expansion of its waterworks and system.

MOBILE, ALA.—Mobile Fixture & Equipment Co. has been incorporated with $25,000 capital to manufacture office fixtures by J. L. Bedsole, 300 South Georgia avenue.

JACKSONVILLE, FLA.—Spencer Mill Co. plans hydroelectric development on the St. Marys and Suwanee rivers, in the vicinity of Waycross, Ga.

MIAMI, FLA.—A. C. Grimm Co. Inc., 736 Southwest Sixth street, plans to build an addition to its plant to manufacture cabinets.

MIAMI, FLA.—General Equipment Machinery Co. has been incorporated by I. E. Schilling, 1822 North East Second Court.

ORLANDO, FLA.—Fred G. Tedeger Inc. has been incorporated with $10,000 capital to manufacture electrical equipment by F. G. Tedeger, Lake Shore.

LOUISVILLE, KY.—Kentucky Auto Parts Co. has been incorporated with $10,000 capital by Allen P. Wagner, Benjamin G. Bloch and Samuel B. Sollish.

MAYFIELD, KY.—Kevil Instrument Co. has increased its capitalization from $50,000 to $150,000 of which some probably will be used for plant expansion.

NEW ORLEANS—E. K. Strahan Inc. has been incorporated with $10,000 capital to manufacture and deal in ventilating systems by E. K. Strahan, 2340 Wirth place.

MUSKOGEE, OKLA.—Servicised Products Corp., 53 West Jackson boulevard, Chicago, plans to establish a branch plant for the manufacture of building materials. A. C. Fischer is president.

ARLINGTON, TEX.—Southern Ornamental Iron Works will start work on its new 2-story plant 100 x 317 feet, shortly after the start of 1928.

CORPUS CHRISTI, TEX.—Alamo Iron Works has awarded the contract for electrical work on its new plant to Eugene Ashe Electric Co., 1704 Dowling street. (Noted Dec. 15)

WACO, TEX.—Rapid Battery Mfg. Co. has been incorporated with $25,000 by J. F. Murrell, 2121 North Eighteenth street.

GREENVILLE, S. C.—Norris Bros., 18 East McBee avenue, makers of bobbins, shuttles and kindred textile mill equipment, plan to build a new plant near Macon, Ga.

CLIO, S. C.—Lipscomb Motor Co. has been incorporated with $10,000 capital. The company has a 2-story plant 50 x 195 feet now being remodeled and will install complete shop equipment for repairing and servicing automobiles, trucks, etc.

NASHVILLE, TENN.—Foster & Creighton Co., Fourth at First boulevard, has been awarded the contract for a garage for the County Highway commission to contain machine, blacksmith and repair shops.

WILLIAMSON, W. VA.—Norfolk & Western railroad contemplates improving its unloading dock at the Williamson yards.

Western States

BURBANK, CALIF.—General Water Heater Co., 1610 Hooper avenue, Los Angeles, has purchased property here and expects to build a plant for the manufacture of automatic water heaters.

LONG BEACH, CALIF.—Plans have been completed by O. Perry Riker, Pacific Southwest Bank building, for a new foundry, 88 x 97 feet, to be erected at 1481 Water street for the Craig Shipbuilding Co. The original structure was burned recently.

TORRANCE, CALIF.—Doheny-Stone Drill Co. has awarded the structural steel contract for its plant, to Llewellyn Iron Works.

WILMINGTON, CALIF.—Wilmington Boat Works, Yacht street, maker of pleasure boats, has been incorporated recently and will install two marine railroad drydocks.

WILMINGTON, CALIF.—It is reported that the Newport News Shipbuilding & Dry Dock Co., Newport News, Va., is contemplating the erection of a plant in this city.

OREGON CITY, OREG.—Plans are being prepared for the Oregon City Foundry for a new plant to be erected on property just purchased near Canemah park, to replace its present foundry which was damaged by fire

recently. Plans calls for two building of fireproof construction. J. A. Roake is manager.

TACOMA, WASH.—Purchase of a controlling interest in the Sterling Machinery Co., 1746 Pacific avenue, is announced by M. G. Tennent, president of the Tennent Steel Corp. This will afford the latter company a retail outlet for its products.

West Central

MINNEAPOLIS—Coyle & Roth, makers of gravel screens, contractors' equipment, etc., plan to build a 1-story plant.

MINNEAPOLIS—Carter-Strite Mfg. Co., 513 South Third street, has been organized to manufacture a device for the automatic grilling of bacon. The company is inquiring for mica, heating elements, metal, etc.

KANSAS CITY, MO.—United Motor Service Inc., 2701 Warwick boulevard, plans to build a 2-story automobile repair and service works 100 x 125 feet.

PLEASANT HILL, MO.—Bell-Davis Machinery Mfg. Inc. has been incorporated with $50,000 capital to manufacture castings by John F. Bell, John W. Davis and Roscoe C. Summers.

ST. LOUIS—Reeder Mfg. Co. has been incorporated with $50,000 capital to manufacture foundry supplies by C. H. Reeder, 1026 Fairmount avenue.

Canada

CALGARY, ALTA.—Chapman Mfg. Co. Ltd. has been incorporated to manufacture and deal in engines, boilers, power plants, equipment, etc. with $50,000 capital by George W. Chapman, Arthur Simpson and Isaac Fitch.

EDMONDS, B. C.—The Burnaby municipal council will resubmit to the voters the proposed waterworks extension.

WINNIPEG, B. C.—Interlocking Construction Co. Ltd. has incorporated with $150,000 capital by Edward Stewart, Ernest S. Hayter and Norman A. McMillan.

HAMILTON, ONT.—Semet-Solvay Engineering Co., 40 Rector street, New York, has started work on a coke plant on Depew street, for the Hamilton By-Product Coke Ovens Ltd., 13-15 Main street.

NIAGARA FALLS, ONT.—Taber Ford Construction Co., 533 St. Clair avenue west, Toronto, Ont., has been awarded the general contract for an addition to the plant of the Herbert Morris Crane & Hoist Co., Stanley street. Building to be 1-story, 80 x 162 feet, steel and brick construction.

ORILLIA, ONT.—National Locks Ltd. has been incorporated to manufacture and deal in locks, builders' hardware, tools, etc., with $50,000 capital and 1000 shares no par value stock by Duncan C. Thompson, Francis H. Horne and George D. Walker.

OWEN SOUND, ONT.—William Kennedy & Sons, founders, will add to their lines the machines covered by the patents of the Falk Corp.

STRATFORD, ONT.—Kroehler Mfg. Co. Ltd., is building an addition to its power plant here capable of developing an additional 500 horsepower. The company will start work in the spring on an addition to its factory to be 165 x 250 feet.

TORONTO, ONT.—Art Craft Top & Trimming Co., 9 Bloor street east, is having plans prepared for a 2-story factory at the rear of 74 Yorkville street.

WALKERVILLE, ONT.—Canadian Bridge Co. has been awarded a contract from the Noranda Mines Ltd. for the fabrication and erection of the steel frame work of a concentrating plant to be built on its property in the Rouyn area of Quebec.

MONTREAL, QUE.—The plant of the Canada Brass Products Co., Craig street, damaged by fire Dec. 12, will be repaired immediately and the plant will not shut down.

MONTREAL, QUE.—The plant of the Monarch Electric Co., 12 Waterman street, St. Lambert, was damaged by fire recently and it is expected that owners will make repairs immediately and will require some new tools and machinery.

MONTREAL, QUE.—Canadian Hydro-Electric Corp. Ltd. has been incorporated to carry on the business of a general electric and light, heat and power company, with $62,500,000 capital and 1,000,000 shares no par value stock, by Wilbur H. Howard, Francis C. Dobell and Charles R. McKenzie.

Canada's Cement Output on Steady Basis

Finally revised figures issued by the Canadian bureau of statistics show the production of cement in Canada during 1926 totaled 8,707,021 barrels, valued at $13,013,283, compared with 8,116,597 barrels valued at $14,046,704 in 1925. Seven firms operating 12 plants, with an aggregate capital of $41,380,000 were engaged in the industry, which gave employment to 2340 persons, who received $3,052,662. Exports of cement during the year were 285,932 barrels valued at $358,231 and 21,114 barrels valued at $77,866 were imported.

New Trade Publications

NICKEL GRAY IRON—International Nickel Co., New York, has issued a chart showing approved foundry practice for adding nickel and chromium in the ladle or cupola spout, with handy reference covering types of castings for which alloy additions are recommended and are being successfully used. It is printed on substantial cardboard.

WATER COOLED FURNACE—A booklet containing discussion of some fundamentals of water cooled furnace design is being circulated by the Erie City Iron Works, Erie, Pa. Charts, data and illustrations are combined to give much of value to the engineer interested in getting the most from pulverized coal.

AIR HOISTS—A catalog has been issued by Hanna Engineering Works, Chicago, on its pneumatic hoists. Illustrations of the hoists are shown in parallel columns with plates of construction details. Tables of dimensions, capacities, weights and other data are shown.

OIL PREHEATERS—Alexander Milburn Co., Baltimore, has issued a leaflet on its oil burners and preheaters with illustrations. Various uses are suggested for which these devices are suited.

SUPPLIES—Brass Founders' Supply Co., Newark, N. J., has issued a catalog on equipment and supplies for the brass, bronze, aluminum, iron and steel foundries. The various types of equipment are shown by illustrations. Sizes and data on the equipment and supplies also are presented.

OPTICAL INSTRUMENTS—Herman A. Holtz, testing engineer, New York, has issued a bulletin illustrating a device for the examination of inside surfaces of long hollow forgings, tubes, cylinders and similar objects. Illustrations show construction of the device and the text explains its construction and use.

CENTRIFUGAL PUMPS—A bulletin has been issued by the Pennsylvania Pump & Compressor Co., Easton, Pa., describing its double suction, single stage, centrifugal pumps. Illustrations show the pumps, parts and auxiliary equipment, with charts of efficiency curves and other factors. A table of water flow through a V-notch is included.

SPEED REDUCERS—W. A. Jones Foundry & Machine Co., Chicago, has issued a catalog of its worm gear speed reducers. In addition to showing the reducers in various sizes, details of construction are illustrated, installations are shown and method of machining teeth of gears is described. Data to aid in selection of the proper reducer are included.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized. These preferentials increased by one extra 5 per cent in meeting competition.

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	26	11
7 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½-inch	+13	+25
3 and 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Weld)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
3¼ to 3⅝-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¼-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2½-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off
Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Net prices per foot f.o.b. Pittsburgh

Outside diameter	Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅜-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c
Plates less than ¼-inch or lighter than 11 pounds per square foot.	
Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c
Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.	

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 10.2 pounds per square foot, to and including 7.65 pounds per square foot	.20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including 3/16-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot.	20c
Plates ordered 7.65 pounds per square foot	.30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	.20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull materials subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates	1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection	No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet	No extra
Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra	.10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared with re-entrant angles)

Additional extra	.20c

Model 24-P ejection type press, having box 100" long, 20" wide, 32" deep. Finished bales measure 20" x 16" x 16" minimum. Can be equipped with power operated loading hopper.

LOGEMANN SCRAP METAL PRESSES

Hydraulically compressed scrap commands at all times the *best price*, and can be conveniently stored and held for favorable markets; it is easily handled; it practically eliminates corrosion; it saves much time in remelting; cars can be easily loaded to capacity.

***LOGEMANN Presses* are built in several types and sizes to suit all requirements.**

You cannot go wrong on a LOGEMANN—it's a money maker from the day it is set in operation.

LOGEMANN BROTHERS COMPANY
3126 Burleigh St. Milwaukee, Wis.

Pioneers!

LOGEMANN Scrap Metal Presses, pioneers in this industry, enjoy an enviable reputation for long life and economical operation. They are in daily use in practically every large sheet mill, stamping plant, scrap yard, and in metalworking establishments of all kinds.

Our many years of accumulated experience, and services of our Engineering Department are at the disposal of all plants accumulating metal scrap of any kind.

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ABRASIVE (Polishing)
Norton Co., Worcester, Mass.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Air Reduction Sales Co., 342 Madison Ave., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Air Reduction Sales Co., 342 Madison Ave., New York City.
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th and Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

AIR FILTERS
Midwest Air Filters, Inc., Bradford, Pa.

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM (Vanadium)
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Annealing Box Co., 801 Beaver Ave., N. S., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.
American Welding & Mfg. Co., The, Warren, Ohio.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARS (Alloy)
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcing)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Ryerson, Jos. T., & Son., Inc., 16th and Rockwell Sts., Chicago, Ill.

BARS (Iron and Steel)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Keystone Drawn Steel Co., Spring City, Pa.
Migret, Rene, 7 Boulevard DeFontaine, Charleroi, Belgium
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Migret, Rene, 7 Boulevard Defontaine, Charleroi, Belgium
Phoenix Iron Co., The, 20 So. 15th Philadelphia, Pa
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Hyatt Roller Bearing Co., Newark, N. J.
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Motor)
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS, (Oilless)
Rhoades, R. W., Metaline Co., Inc., Rhoades Bldg., Long Island City, N. Y.

BEARINGS (Roller)
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Tapered Roller
Timken Roller Bearing Co., The, Canton, O.

BEARINGS (Thrust)
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT FASTENERS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.

BENCHES AND FRAMES (Wire Drawing)
Vaughn Machinery Co., Cuyahoga Falls, O.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

DEC 29 1927

See Yellow Section for Contents, Market Review

IRON TRADE REVIEW

Registered U. S. Patent Office

CLEVELAND, O., DECEMBER 29, 1927

FARRELL'S 85

A Real Aid to Engineers in Designing "Hard Service" Castings. The Physicals of This Cast Steel Make It Possible to Fit Each Casting to Its Respective Job Insofar as Inherent Strength, Ductility, Toughness and Wear Resistance Are Concerned. "A Tough Steel for Rough Use."

Digger Teeth

Bucket Lips

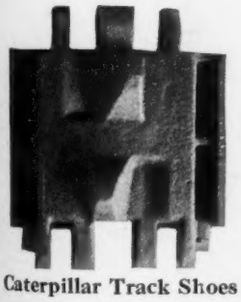
Physical Properties of a FARRELL'S 85

	Tensile	Yield Pt.	Elong.	Red. Area	Approx. Brin.
Grade H.	103,000	81,400	21.5%	36.5%	200
Grade H.H.	120,000	102,000	17.8%	33.4%	225
Grade A.	100,000	60,000	20 %	25 %	250
Grade B.	150,000	113,000	10 %	20 %	300
Grade C.	175,000	140,000	7 %	15 %	400

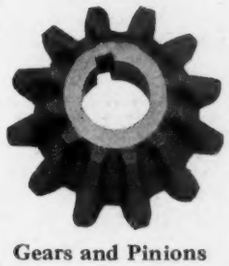
Track shoes
Rollers
Sprockets
Tooth inserts
Bucket shells
Bucket lips
Side Cutters
Digger teeth
Side plates

Sheaves
Brackets
Cast tooth gears
Idler Wheels
Crane Wheels
Industrial Car Wheels
Railway frogs
Conveyor chain
Special Chain

Conveyor Buckets
Screen plates
Wearing plates
Chute liners
Gudgeons
Crusher concaves
Jaw plates
Ball mill liners
Pinions
Pump casings



Caterpillar Track Shoes



Gears and Pinions

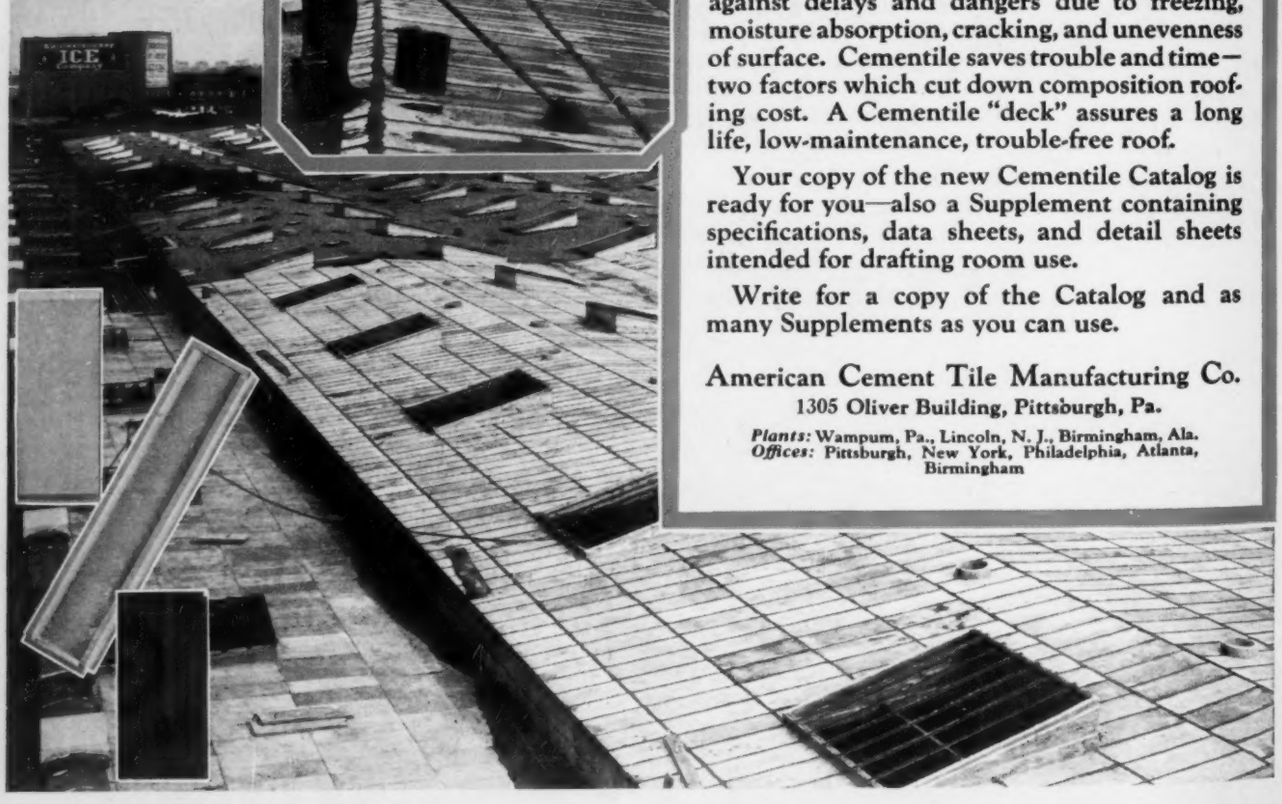
SEE OUR EXHIBIT AT THE GOOD ROADS SHOW
CLEVELAND — JAN. 9th to 13th, 1928.

Farrell-Cheek Steel Foundry Co., Sandusky, Ohio

Eastern Office: 50 Church St., New York

CEMENTILE

The Dependable Deck for Composition Roofing



Flat or Channel Cementile is the most dependable and satisfactory foundation for composition roofing.

Cementile is strong, each tile a slab of reinforced concrete. Factory cured, Cementile is practically non-absorbent and its smooth, dry surface makes possible immediate laying of composition roofing, in the coldest winter weather. With Cementile you need not wait for the deck to "set"; and the edges of each Cementile form predetermined expansion joints.

The use of Cementile is the best insurance against delays and dangers due to freezing, moisture absorption, cracking, and unevenness of surface. Cementile saves trouble and time—two factors which cut down composition roofing cost. A Cementile "deck" assures a long life, low-maintenance, trouble-free roof.

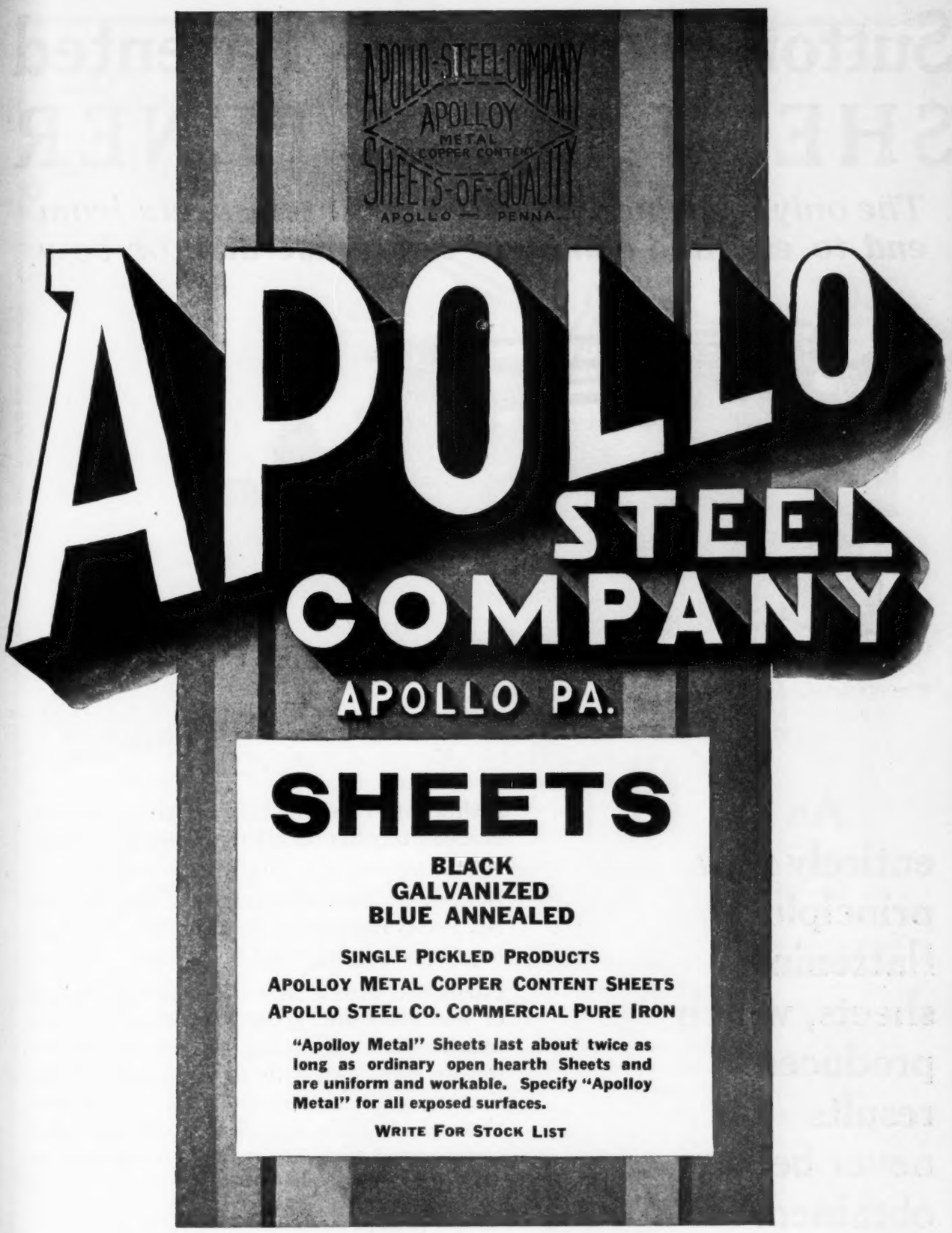
Your copy of the new Cementile Catalog is ready for you—also a Supplement containing specifications, data sheets, and detail sheets intended for drafting room use.

Write for a copy of the Catalog and as many Supplements as you can use.

American Cement Tile Manufacturing Co.
1305 Oliver Building, Pittsburgh, Pa.

Plants: Wampum, Pa., Lincoln, N. J., Birmingham, Ala.
Offices: Pittsburgh, New York, Philadelphia, Atlanta, Birmingham

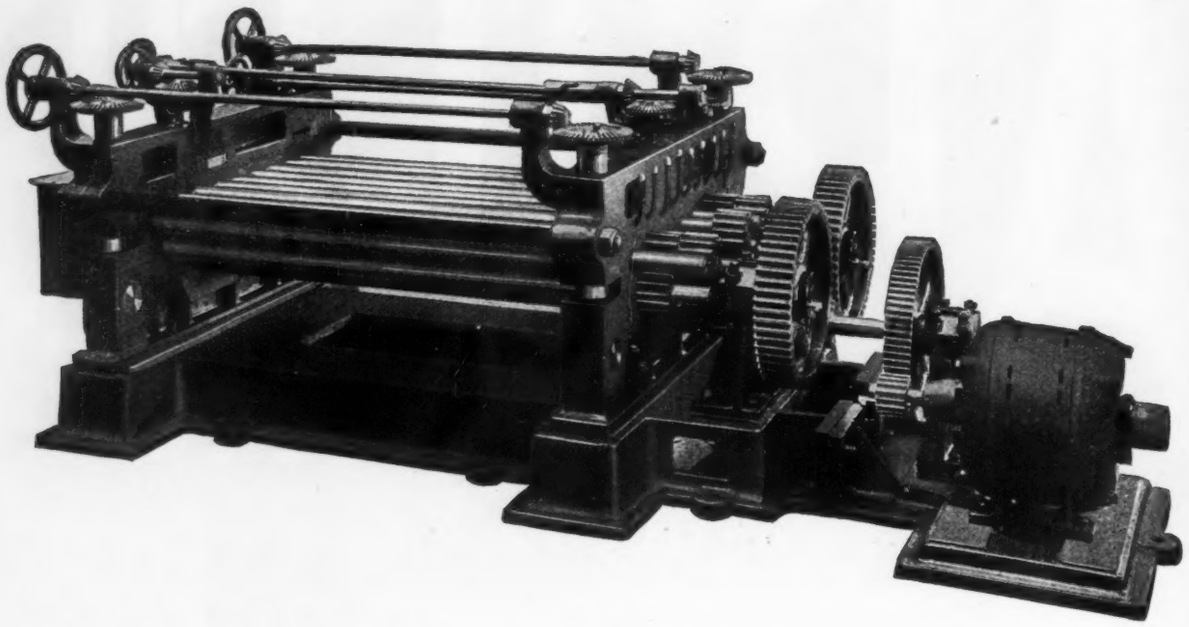
Vol. 81, No. 26, Dec. 29, 1927, issue of IRON TRADE REVIEW, published weekly at Cleveland, Ohio. Entered as second class matter at the post office, Cleveland, Ohio, under the act of March 3, 1879. Subscription prices $6.00 a year in U. S.; $8.50 in Canada; foreign £2:0:0; single copies 25c.



APOLLOY for PERMANENCE

Sutton No. 2—60" Patented SHEET FLATTENER

The only machine that will straighten sheets from end to end and eliminate crosswise dish or bow



An entirely new principle of flattening sheets, which produces results never before obtained.

A sheet after passing through this machine is absolutely flat both lengthwise and crosswise.

Besides its patented features the Sutton No. 2 sixty inch machine embodies the best known principles of all flatteners.

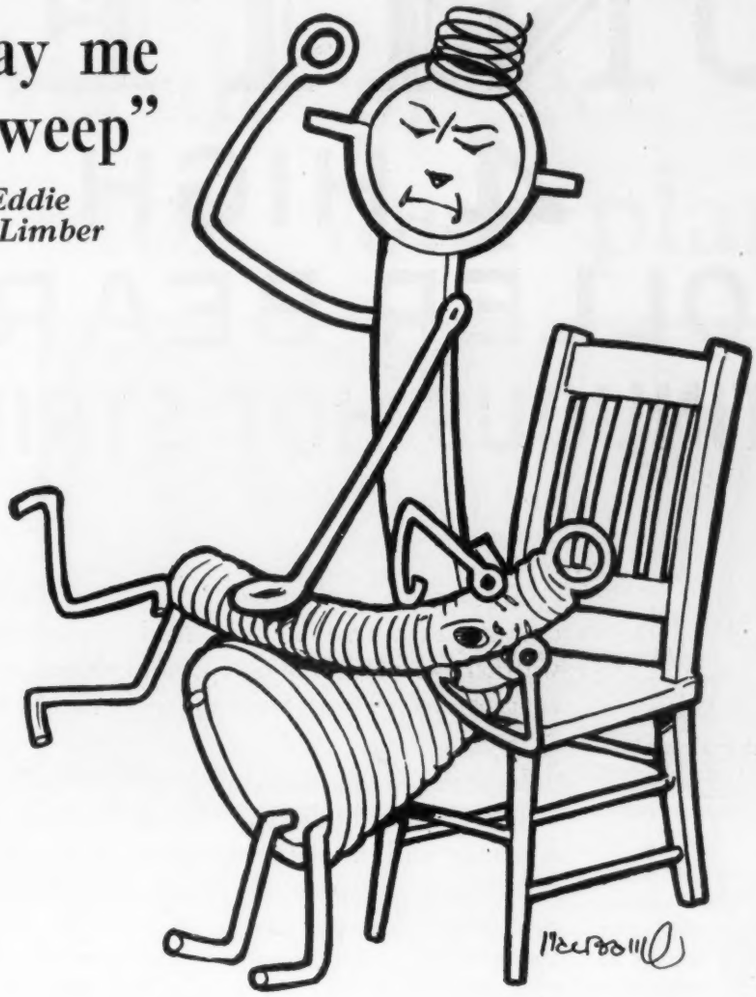
Furnished with either high carbon forged or hardened and ground steel rolls. Has independent adjusting screws for eliminating dish. All rolls except patented deflecting rolls are driven. All rolls driven through flexible spindles if desired; also constructed with separate herringbone or spur gear drive.

Drop us a line for the full details.

SUTTON ENGINEERING CO.
PARK BUILDING PITTSBURGH, PA.

"Now I lay me down to weep"

—cries Eddie Extension Limber



"MY GOSH, you kin take lotsa punishment! Its in the Limber blood, I guess. I hardly know whether this poundin' is hurtin' me or you more. But just because you're Eddie Extension Limber is no reason for you to try and tackle that heavy "automatic" job.

As sure as my name is Fanny Flatspring Limber, it would take your big brother Charlie Compression or even old Larry Limber himself to stand the gaff there an' keep in good health year in an' year out. Eh—sure you could stand it—I know yore a good husky kid, an' strong an' willin! But there's no sense to you takin' the bread outa the mouths of your own family wen you been on your job only five years.

I bet in five more years the boss might give you a raise, or he might even put you to work on his car. Look at your sister Tillie Torsion. Didn't her boss put her on the switchboard after her eight years on the typewriter? Better stay on your job, Eddie, and let that "automatic" man get some more Limbers from the old homestead in Holly, Michigan. There's loads of 'em up there lookin' fer permanent jobs."

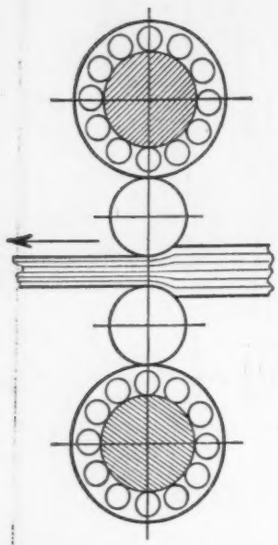
Springs of All Types
Also Wire Forms

American Spring & Manufacturing Corp.

ELM STREET, HOLLY, MICH.

"UNITED"

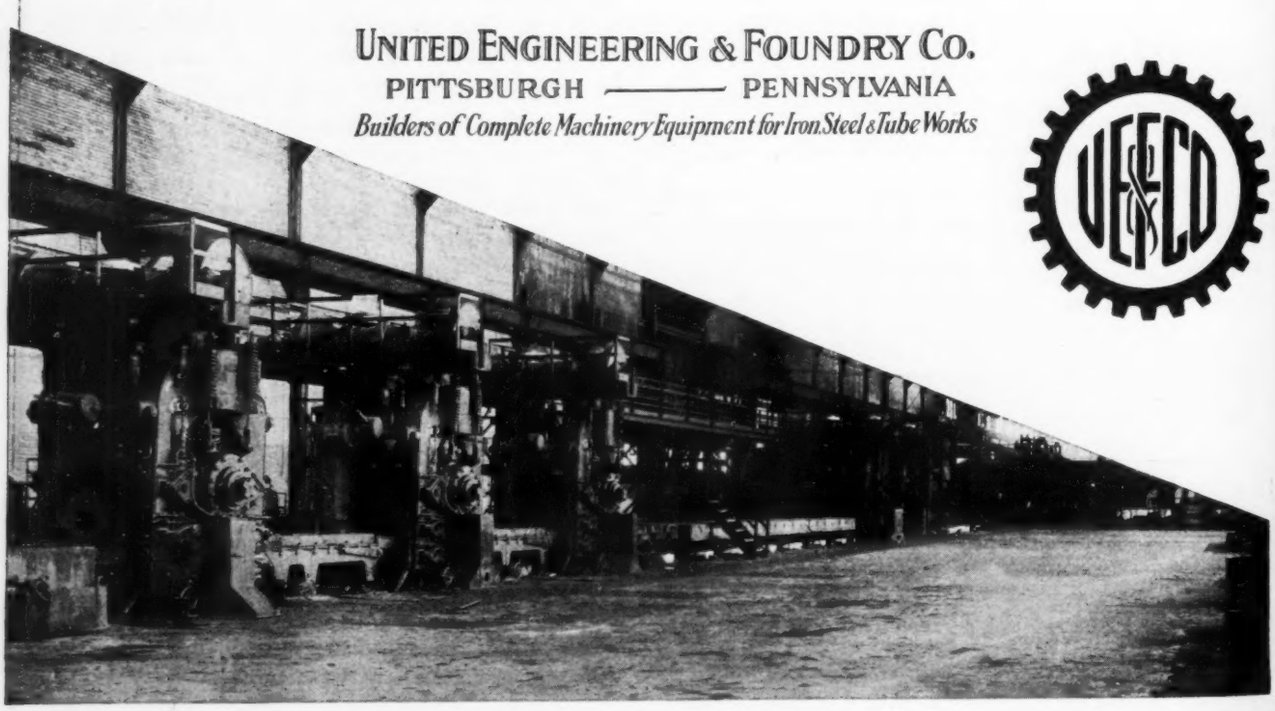
4 HIGH ROLLER BEARING CONTINUOUS HOT STRIP MILLS



This type of continuous hot strip mill is now in successful operation in five leading steel plants for rolling various widths and gauges of strips and sheets. Their capacities ranging from 1 inch wide up to 48 inches wide.

Experience has shown that they will produce a large tonnage of the highest quality of product with the greatest accuracy and, at the same time, reduce the power required for rolling; increase the output per man and reduce the production cost per ton.

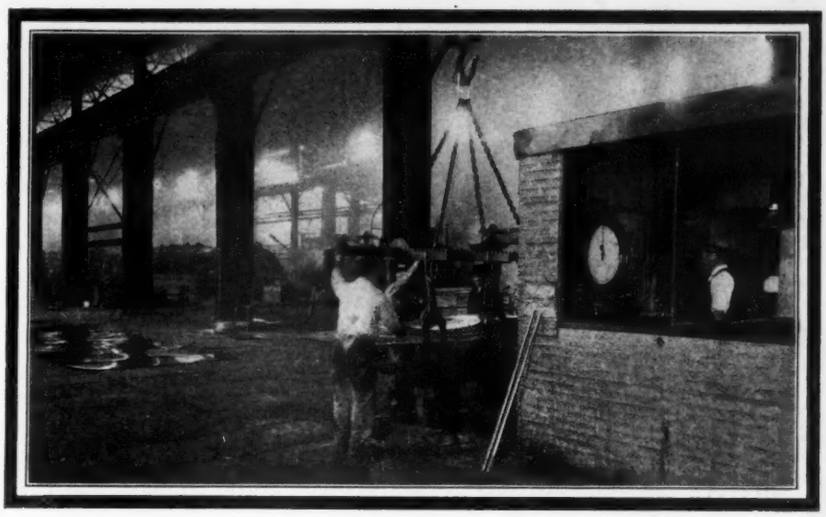
UNITED ENGINEERING & FOUNDRY CO.
PITTSBURGH ——— PENNSYLVANIA
Builders of Complete Machinery Equipment for Iron, Steel & Tube Works



New 4-high continuous Hot Strip Mill. Trumbull Steel Co., Warren, Ohio

PATENTS PENDING

Dial scale speed -for *your* plant



Fairbanks Dial Scales weighing metal sheets in large sheet steel plant

Fairbanks Dial Scales have introduced a *new tempo* in industrial weighing. For the Fairbanks represents the dial scale at highest speed—due to exclusive rapid reading features of the Fairbanks dial.

Read the full weight of the load on this scale at the tip of the pointer. And read with full assurance of accuracy, for the traditional Fairbanks precision is built into these modern high-speed weighing machines.

The Fairbanks Dial Scale, available in many modifications of design, capacity and type, fits into all modern systems of production — from the simplest to the most elaborate. It ends the belief that weighing involves delay. Fairbanks Dial Scales keep step with the fastest production pace. Loads can be weighed as fast as they can be moved over the scale platform.

In hundreds of plants—perhaps in *yours*—weighing methods of yesterday are a drag on the production requirements of today—or have limited the use of scales to the disadvantage of complete and exact cost and profit knowledge. Investigate high-speed direct-reading Fairbanks Dial Scales. One of our engineers will be glad to tell you what modern scales can accomplish in your plant.

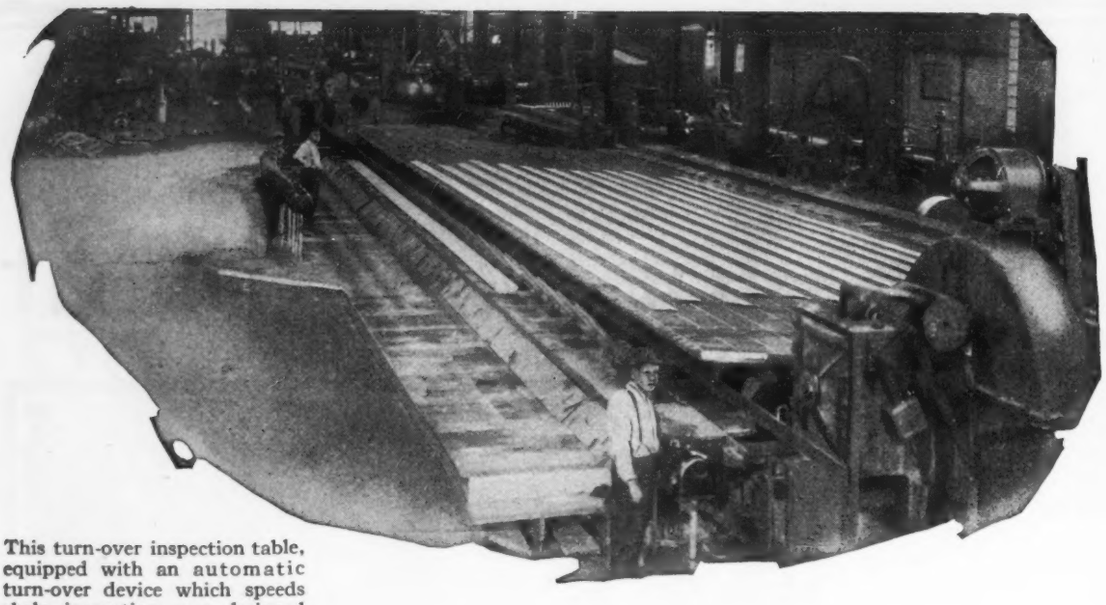
FAIRBANKS, MORSE & CO., Chicago

And 40 other principal cities—a service station at each house

Fairbanks Dial Scales

Preferred the *World Over*

A S A 501. 23



This turn-over inspection table, equipped with an automatic turn-over device which speeds skelp inspection, was designed and built by Birdsboro for a well-known iron company.

Saving Time In Handling Skelp

AMONG the time-saving, cost-reducing equipment which Birdsboro has designed and built for the metal-working industries is a Turn-Over Inspection Table, produced for a well-known manufacturer of boiler tubes.

This improved Inspection Table is equipped with an automatic turn-over device, so that the skelp can be readily and quickly inspected on both sides, deposited on the roller table and conveyed to the shear—at a material saving in time over the equipment formerly employed.

Where can time and labor be saved in your plant with improved hydraulic presses, special machinery, rolling mills, rolling mill machinery or other manufacturing equipment? Birdsboro's Engineers may be able to tell you—without obligating you or involving any expense on your part. May we help you speed production and reduce costs?

BIRDSBORO

STEEL FOUNDRY AND MACHINE COMPANY

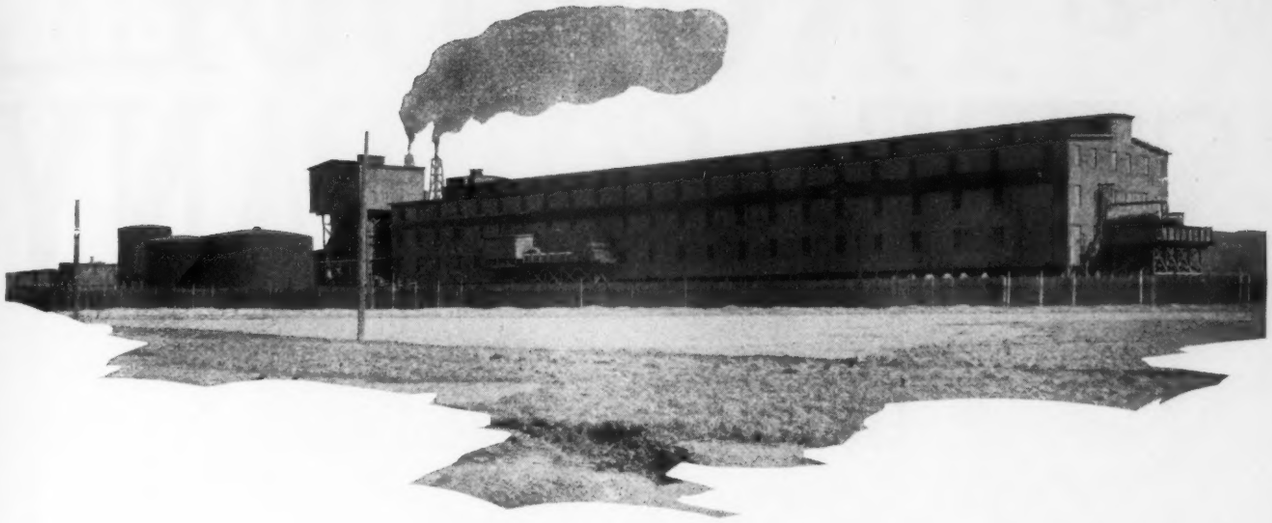
DESIGNERS AND BUILDERS

of hydraulic presses and equipment for boiler, structural and railroad shops, shipyards, rubber mills, linoleum plants, asbestos mills and other industries requiring hydraulic equipment. Hydraulic Operating Valves. Special Machinery. Rolling Mills. Rolling Mill Machinery. Steel and Iron Castings. Rolls: "Durite", Steel, Chilled and Sand. Railroad Castings. Bolsters. Side Frames. Forging Ingots. Crushing and Concentrating Machinery. Jackson Belt Lacers.

BIRDSBORO, PENNSYLVANIA

NEW YORK	Pittsburgh	Washington, D. C.	Baltimore	Chicago
90 West St.	Empire Building	Munsey Building	Citizen Nat. Bank Bldg.	310 S. Michigan Ave.

Acid Fumes-Smoke-Moisture-Salt Air



Where Ordinary Sheet Metal Deteriorates — Use *Lead-sealed*

PROCESS PLANTS and others find Lead-Sealed Roofing, Siding and other metal work uniquely fitted for conditions where ordinary sheet metal quickly deteriorates.

Its *Pure Lead* surfaces resist rust and acid action; the steel core gives it strength with light weight. For moderate first cost and extremely long service under difficult conditions we recommend this material.

Write for sample and Complete Information

THE SUPERIOR SHEET STEEL CO.
Canton, Ohio

Makers of *Super-Metal*, *Galvannealed*, Galvanized and Lon3 Terne Sheets

Two heavy surfaces of PURE LEAD are firmly amalgamated to a core of special analysis, copper content steel. The base metal IS sealed.

Lead-sealed

Roofing and Siding
Eaves Trough, Gutters, Conductors and Accessories

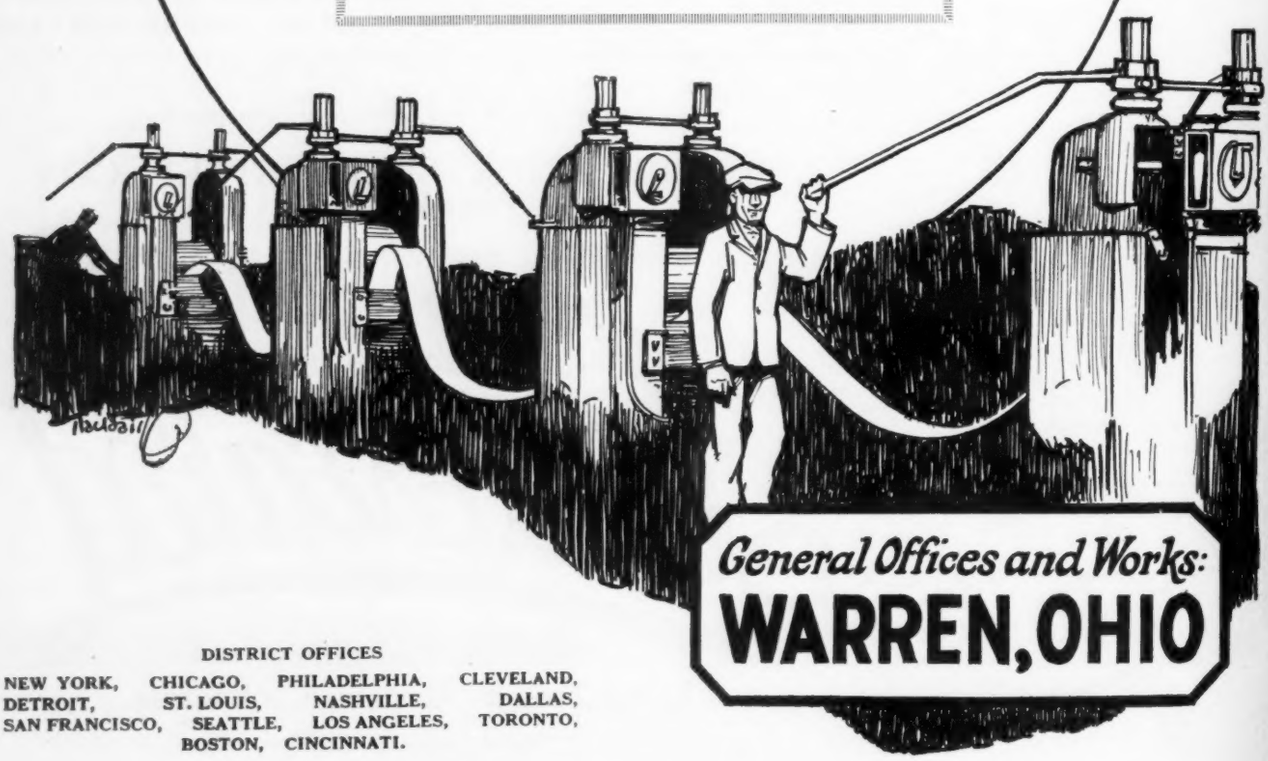
The TRUMBULL STEEL COMPANY

Hot and Cold Rolled

Strip Steel

All Sizes and Gauges

Electrical, Blue Annealed,
Black and Galvanized Sheets,
Tin Mill Black, Tin Plate,
Long Ternes



General Offices and Works:
WARREN, OHIO

DISTRICT OFFICES

NEW YORK, CHICAGO, PHILADELPHIA, CLEVELAND, DETROIT, ST. LOUIS, NASHVILLE, DALLAS, SAN FRANCISCO, SEATTLE, LOS ANGELES, TORONTO, BOSTON, CINCINNATI.

Standardized design reduces crane costs

for instance these trolley frames

NOTICE the similarity of the three crane trolley frames illustrated below. Although for cranes of varying capacity they are basically the same in design, differing in weight and section to meet the service for which the crane is intended. These trolley frames can be furnished in any length, depending on the required amount of drum winding capacity.

The GIRTS (1) are of open hearth steel castings, connected by a BODY PIECE (2) of wrought steel plate securely welded to the girt, and amply braced on the underside by gusset plates, giving additional resistance to distortion. This frame is carried by axle brackets made of heavy seamless drawn steel tubing, passing through bored openings in the girts.

Unlike any solid iron or steel frame the Compact Trolley frame, because of its composite construction, is free from shrinkage stresses or defects. It does not change form, hence its exact trueness is unaffected by seasoning or by loading while in use.

* * * * * *

Standardized design and a sectionalized trolley construction in interchangeable sections permits each trolley to be built up of units suitable for the service intended, instead of an arbitrary combination.

Standardization, too, enables quantity production—lower manufacturing cost. The Compact Crane made by Shepard provides a machine of quality, precisely suited to the job, at a low selling price.

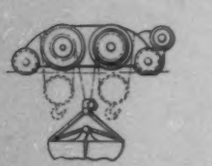
Compact Crane

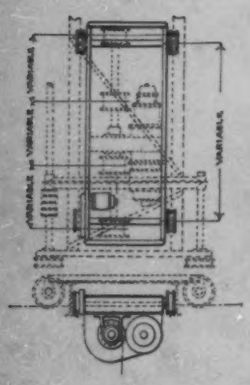
Strength *and* Stamina in these Cranes of Steel

and the right trolley for the job

CLOSE LIFT TROLLEY

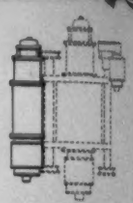
DOUBLE HOOK TROLLEY



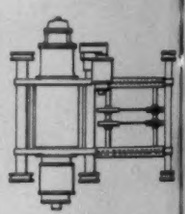


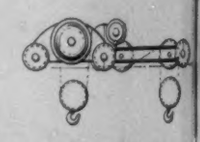
SUBMERGED TROLLEY

TWIN HOOK TROLLEY



AUXILIARY HOIST TROLLEY





EXTENSION TROLLEY

WHEN you install a Compact Crane, you buy more than merely a crane; you invest in a very definite crane service, that may be depended on day after day, year in, year out.

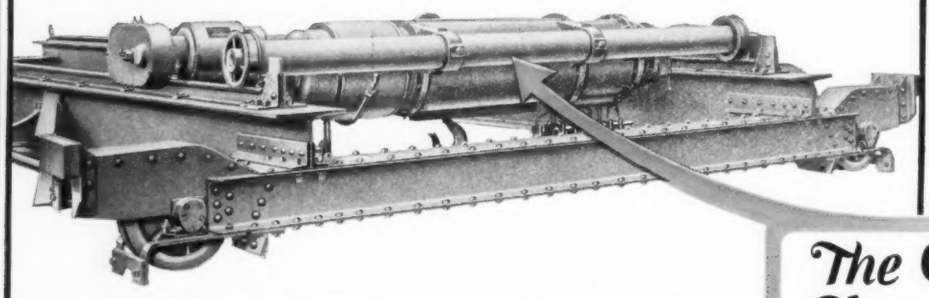
All parts have been given the most rugged details, which, together with the use of steel throughout and the all-around compact construction, assure strength and resistance to strains without the burden of excessive weight.

The trolleys, though adaptable to special conditions, are of the well-known Shepard design—a a Balanced Drive, straight line construction in units each separately accessible, and automatic oil bath lubrication — features responsible for the position of predominance held by Shepard products for over a quarter century.

A few adaptations of the Compact Crane trolley are illustrated —among them you may see a type that fills a long felt need in your plant. It will pay you to investigate.

Let us explain fully the advantages of this unique crane design—and its economy.

SHEPARD ELECTRIC CRANE & HOIST CO.
358 Schuyler Ave., Montour Falls, N. Y.



SHEPARD
ELECTRIC CRANES & HOISTS

The Close Clearance Trolley

For use where headroom is extremely limited — without sacrifice of sound engineering principles.

EMPIRE cold-punched steel nuts do not fracture or strip. They have no burrs or scale. They have the thread accuracy of a gauge . . . . .

Make *him* your purchasing agent

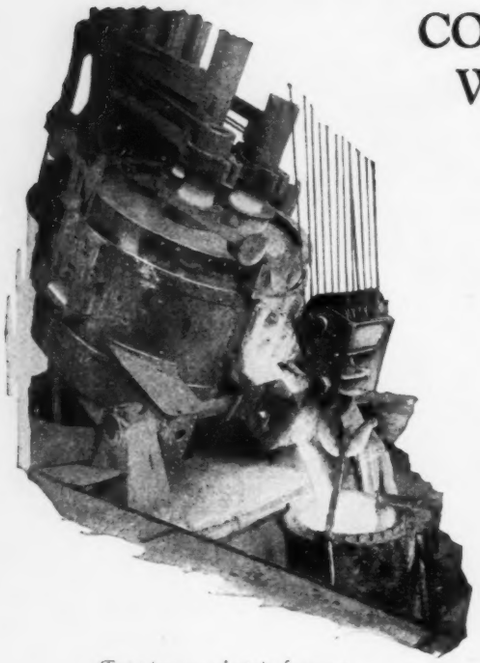
IF the men who *use* bolts and nuts were in the purchasing agent's chair, there'd be a change in the way bolts and nuts are *purchased* for a great many shops. The short-sighted economy in the purchase of hot pressed nuts, for instance, would stop suddenly. Empire cold-punched nuts would be specified on every list. For the men in the shop know what many purchasing agents are beginning to recognize and that is the *final economy* in buying the best—the name is Empire.

RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY
PORT CHESTER, N.Y.

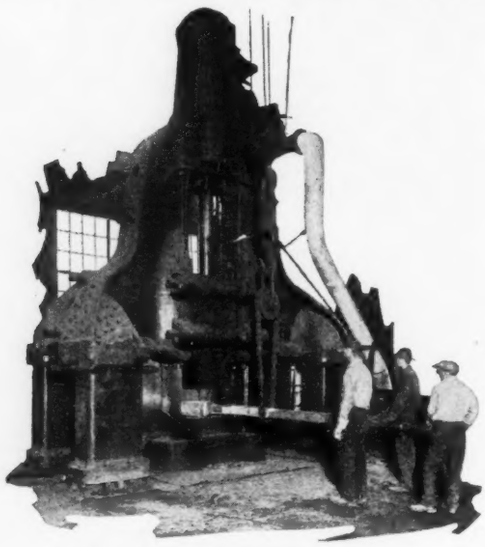
CHICAGO · DETROIT · ROCK FALLS Ills. · SEATTLE · SAN FRANCISCO

EMPIRE BOLTS & NUTS

CONTROL OVER QUALITY AND WORKMANSHIP—FROM ORE TO FINISHED PRODUCT



Tapping an electric furnace



12,000-lb. steam cogging hammer

Performance—an important quality of Bethlehem Tool Steels

The Bethlehem Tool Steel plant is a self-sustained manufacturing unit, having its own electric furnaces, cogging hammers, rolling mills, and annealing furnaces.

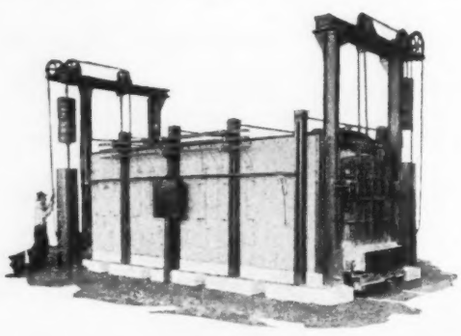
With ample equipment of the most suitable sizes and types for tool steel manufacture, we are able to produce steels to high standards of quality, to maintain uniformity of product, and render pleasing service.

Bethlehem Tool Steels give unexcelled performance. Each lot of steel is thoroughly tested under conditions similar to those it will meet in service.

Our tool steel experts can show you the way to better tool steel performance. They will gladly consult with you, without obligation.

GOLD MEDAL AWARD

At the recent Sesqui-Centennial Exposition at Philadelphia, Bethlehem Steel Company was awarded a gold medal in recognition of the excellent qualities of Bethlehem Tool Steels.



An electric annealing furnace

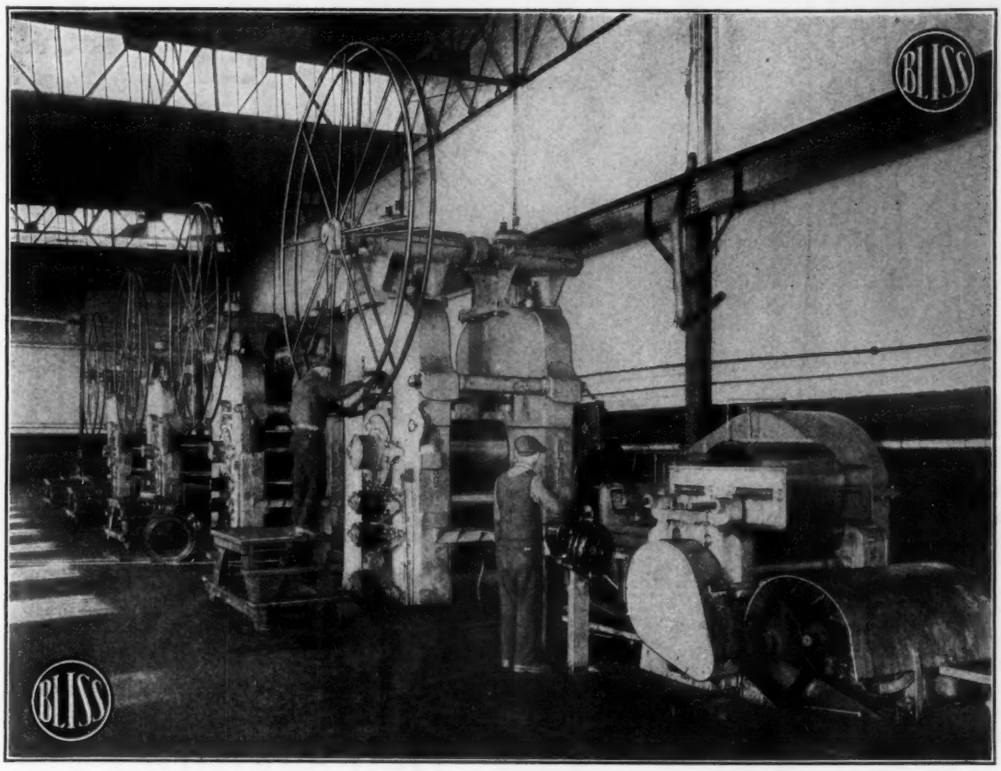
BETHLEHEM STEEL COMPANY
General Offices: BETHLEHEM, PA.

DISTRICT OFFICES

New York Boston Philadelphia Baltimore Washington Atlanta Pittsburgh
Buffalo Cleveland Detroit Cincinnati Chicago St. Louis San Francisco
Los Angeles Seattle Portland

Bethlehem Steel Export Corporation, 25 Broadway, New York City, Sole Exporter of our Commercial Products

BETHLEHEM



BLISS MILLS
FOR
HOT *and* COLD ROLLING

The above illustration shows our mills in operation

AT COLUMBIA STEEL CO., BUTLER, PA.
ROLLING STRIP SHEETS

They are equipped with Roller Bearings, (Jones special type mounting — Patent Pending) on necks of work rolls as well as supporting rolls.

Similarly equipped your present hot or cold mills will show a very considerable saving in your power bill.

We will be pleased to discuss with you this and other mill details.

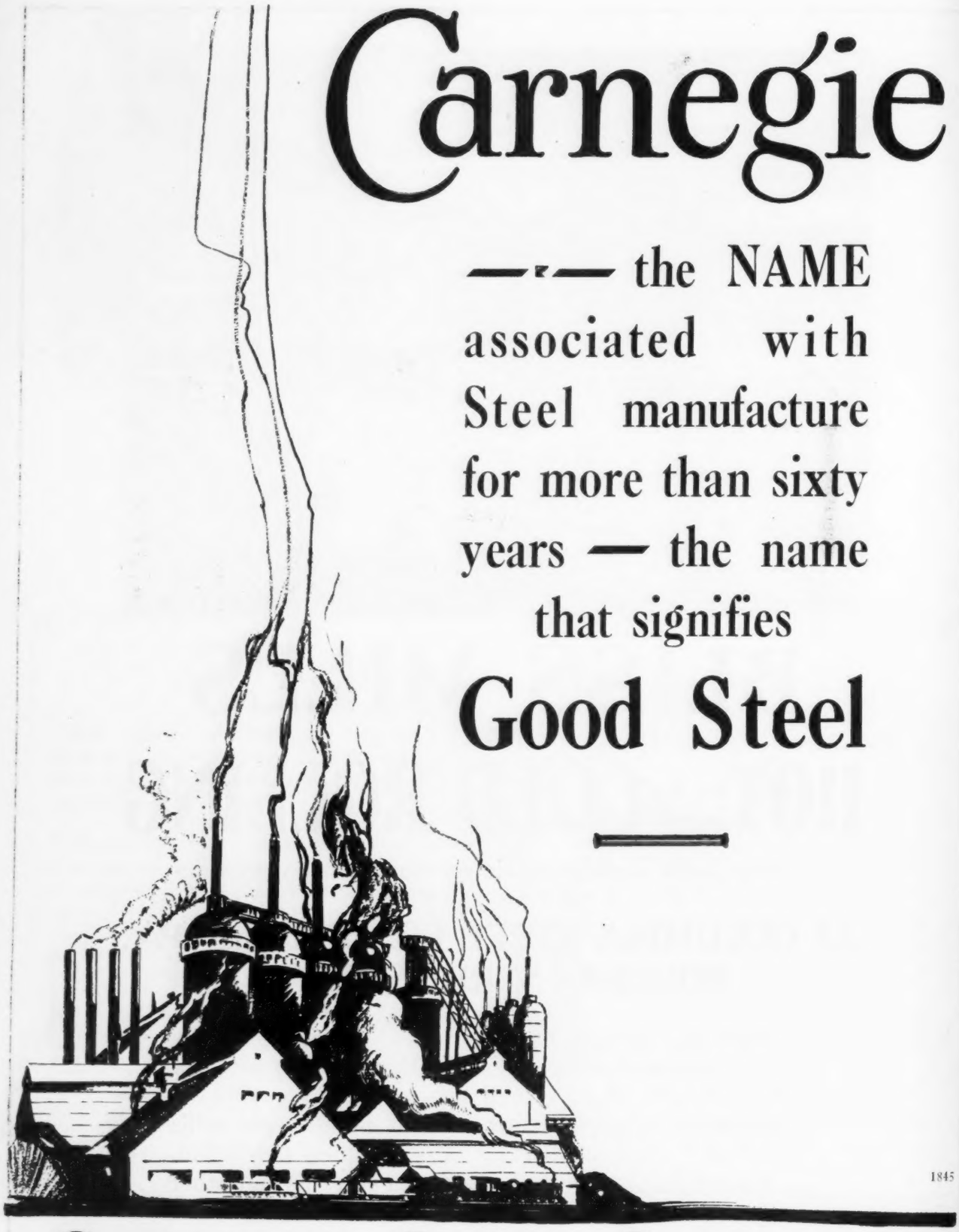
Catalog on request.

E.W. BLISS CO.
BROOKLYN, N.Y.
SALEM, OHIO.

Carnegie

— the NAME associated with Steel manufacture for more than sixty years — the name that signifies

Good Steel



1845

CARNEGIE STEEL COMPANY

General Offices • Carnegie Building • 434 Fifth Avenue

PITTSBURGH PENNSYLVANIA

The Cleveland Crane & Engineering Company, *Wickliffe, Ohio*

30 Church Street
New York City

511 Farmers Bank Building
Pittsburgh, Penna.

557 Railway Exchange Building
Chicago, Illinois

Manufacturers of
CLEVELAND
TRAMRAIL SYSTEMS

CLEVELAND CRANES

All Sizes for
Every Service

100 YEARS OF STEEL IMPROVEMENT

Number Nine in a Series of Advertisements

THE ENGINEERING PROBLEMS OF 1905

LIKE MANY OF THOSE TODAY, WERE SOLVED BY AUTOMOTIVE ENGINEERS WHEN THEY SPECIFIED A NICKEL STEEL

THE Franklin Automobile of 1906 was among the first—if not the very first—to employ 3½% Nickel Steel gears.

Franklin engineers specified this superior Alloy Steel when they were confronted with a need for properties that were not available in any other material. Now—more than twenty years later—engineers in many different fields are still specifying Nickel Alloy Steels to secure uniform properties and dependable performance.

The many years of Nickel Steel development have contributed to an extensive fund of information concerning the superior properties and many uses of these Alloys. You are invited to consult our staff of engineers and thus draw upon these helpful data.

When Franklin engineers designed the 1906 Model in 1905, they specified a 3½% Nickel Steel for transmission and pinion gears. In 1907, a Nickel Steel was also adopted for steering knuckles. Twenty years later, Franklin engineers are still specifying the same Nickel Steels

SOME STANDARD APPLICATIONS OF NICKEL ALLOY STEELS

Armor-Plate	Ordnance
Axles	Railway Track Work
Boiler & Fire Box Plate	Roller Bearings
Boiler Tubes	Shafts
Bolts, Nuts, Rivets, etc.	Shovels
Castings	Special Tools
Crank Shafts	Steel Mill Rolls
Dies & Die Blocks	Structural Shapes
Forgings	Turbine Blading
Gears & Pinions	Valve Bodies
Mechanical Tubing	Welding Rod

FOR STRENGTH WHERE THE STRESS COMES

ALLOY STEEL

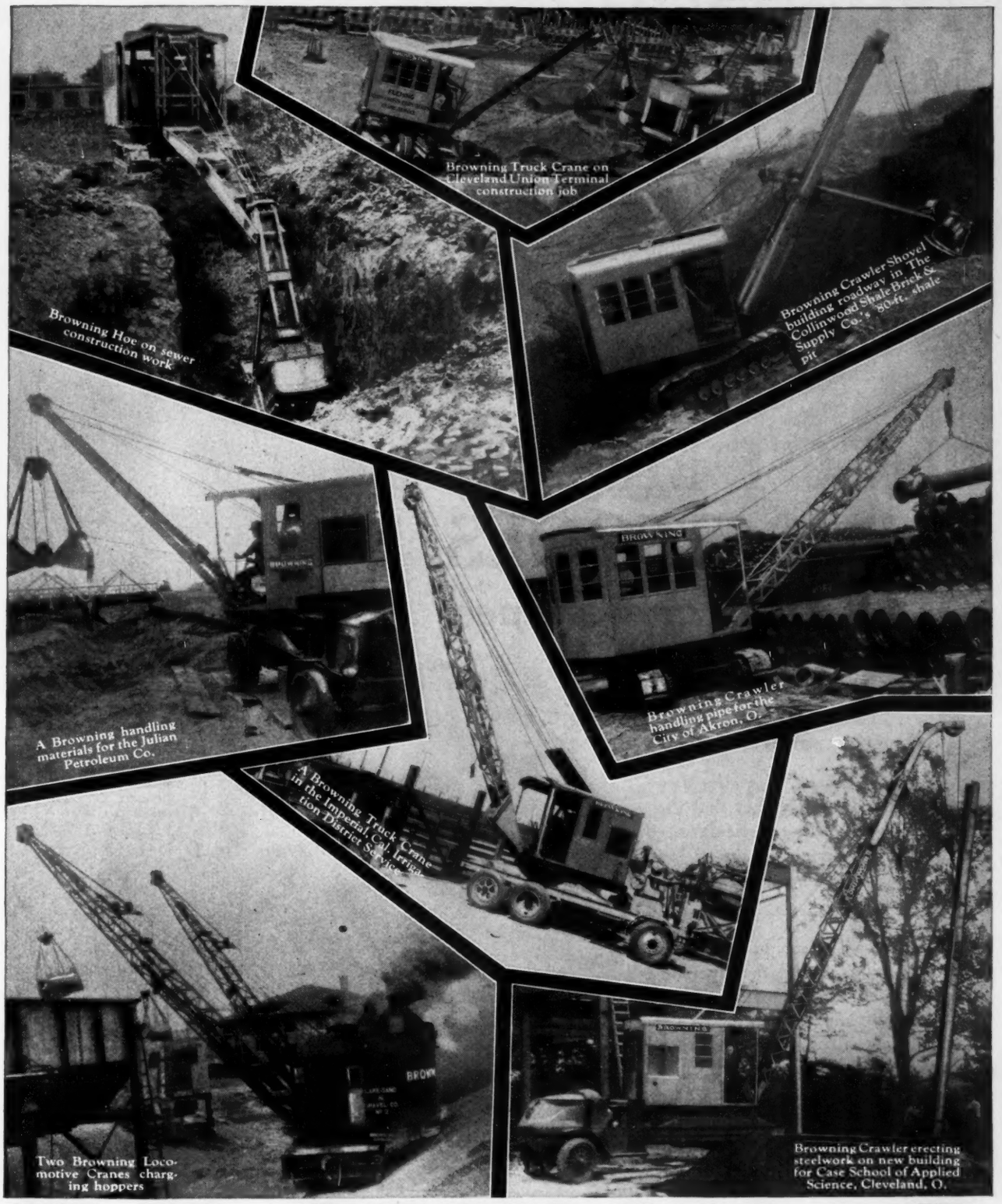
Send for Buyers' Guide of Nickel Alloy Steel Products

Nickel

FOR ALLOY STEEL

THE INTERNATIONAL NICKEL COMPANY (INC.), 67 WALL STREET, NEW YORK, N. Y.

Brownings "fit in" on every type of job!


Browning Truck Crane on Cleveland Union Terminal construction job
Browning Hoe on sewer construction work
Browning Crawler Shovel building roadway in The Collinwood Shale Brick & Supply Co.'s 80-ft. shale pit
A Browning handling materials for the Julian Petroleum Co.
Browning Crawler handling pipe for the City of Akron, O.
A Browning Truck Crane in the Imperial, Cal. Irrigation District Service
Two Browning Locomotive Cranes charging hoppers
Browning Crawler erecting steelwork on new building for Case School of Applied Science, Cleveland, O.

BROWNING

THE BROWNING CRANE COMPANY

16226 Waterloo Road ∴ ∴ ∴ ∴ **CLEVELAND, OHIO**

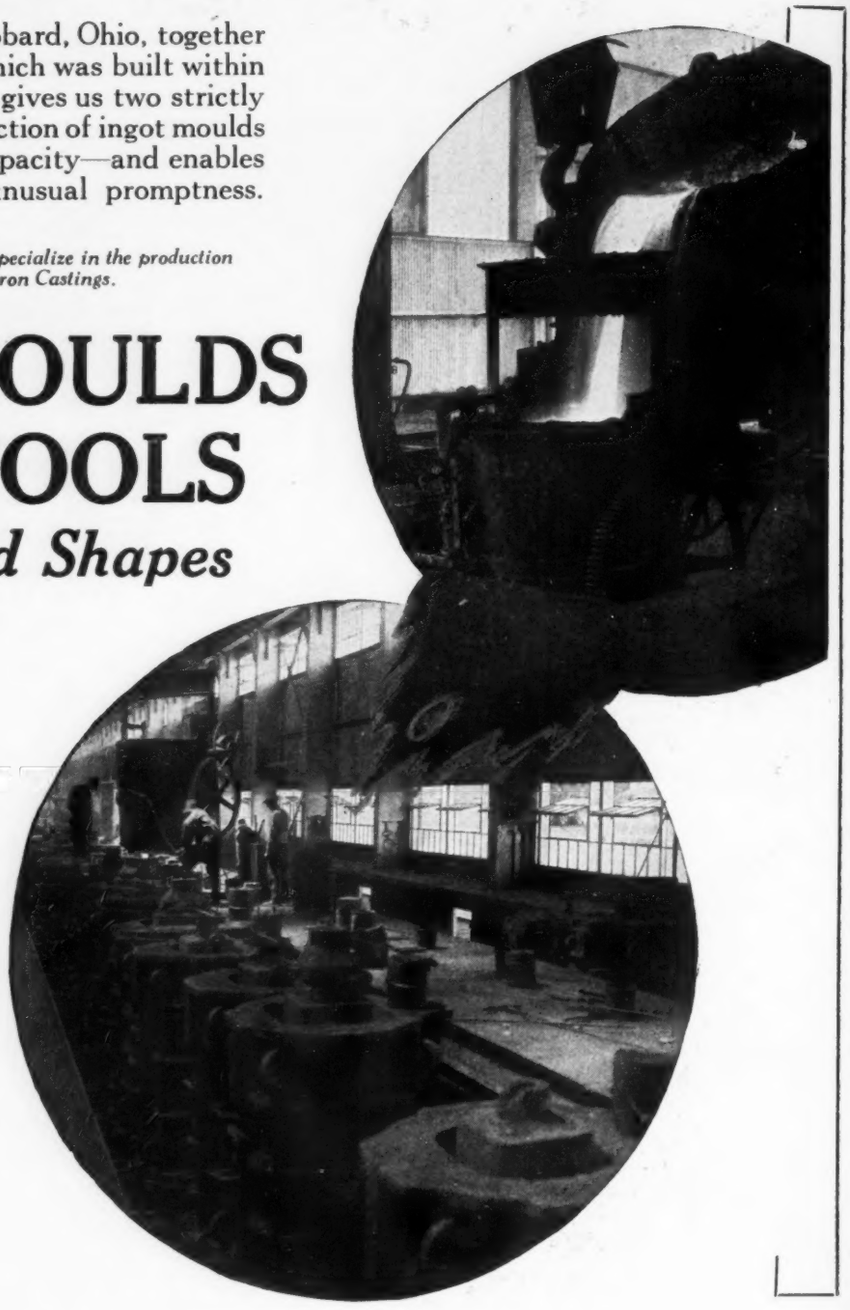
See The Browning Cranes at the 1928 Convention and Road Show, American Road Builders Ass'n., January 9th-13th inclusive, at Cleveland, Ohio

New Valley Plant—

Makes the world's largest manufacturers of ingot moulds still larger

Our new main plant at Hubbard, Ohio, together with our Chicago branch which was built within the last two years, not only gives us two strictly modern plants for the production of ingot moulds but greatly increases our capacity—and enables us to fill all orders with unusual promptness.

Our Sharpsville, Pa., plant will now specialize in the production of Cupola Moulds and Iron Castings.



INGOT MOULDS AND STOOLS

All Sizes and Shapes

The *great success of Valley Ingot Moulds* is due to the fact that they are designed for the particular need of the individual purchaser, and produce the maximum yield of quality steel.

Our 35 years of mould making and steel producing and the diversified experience resulting from service to most of America's foremost steel producers will on request be applied by our staff to your problems.

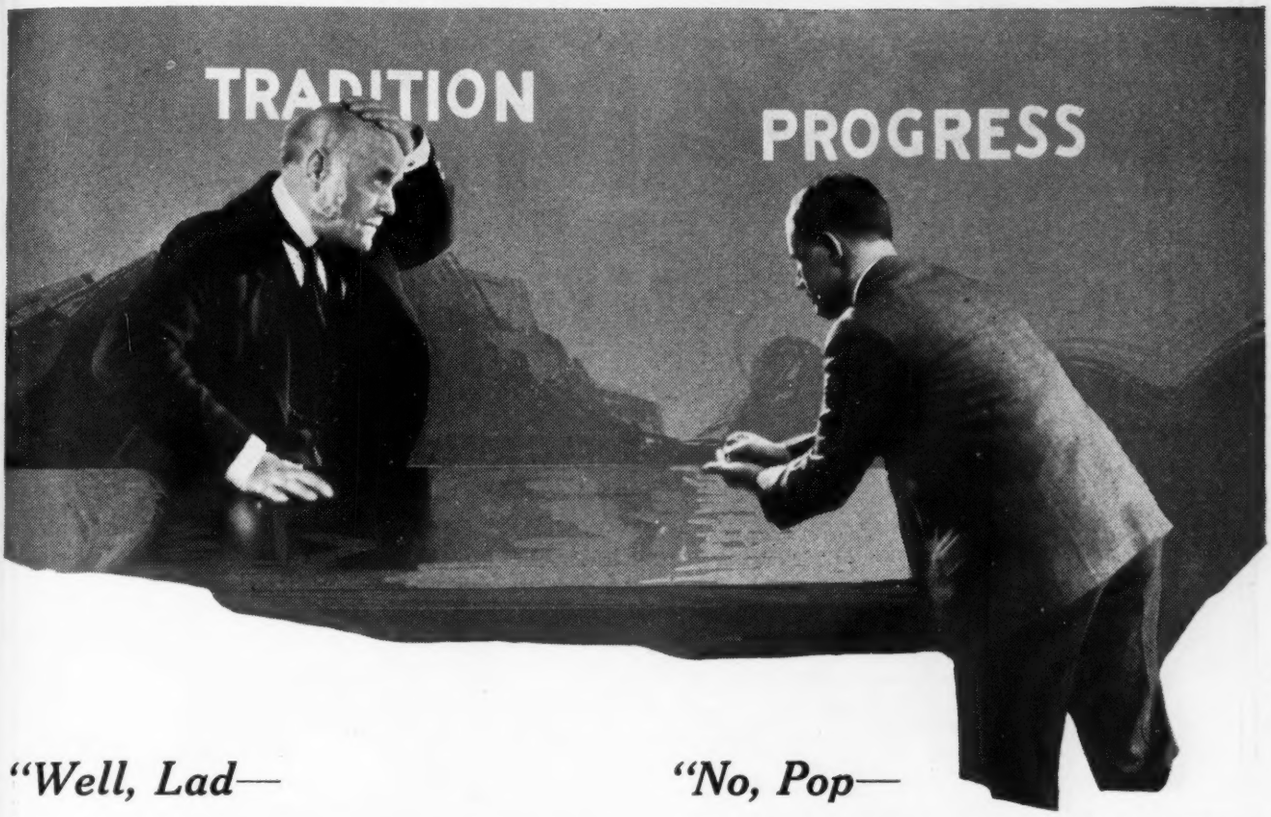
Valley Mould and Iron Corporation

Main Office: Hubbard, Ohio

Western Office: 108th St. & Calumet River, So. Chicago, Ill.

Plants { Hubbard, Ohio
Sharpsville, Pa.
So. Chicago, Ill.

Pop Thinks of Patterns as Assets.



"Well, Lad—

Last night our pattern storage building was hit by lightning but fortunately little damage was done.

I guess we're safe from now on because you know lightning never strikes twice in the same place."

"No, Pop—

but hard luck hasn't the same versatility and *that* is continually hitting our business and it hits us in the same tender spot every time—the castings we keep on making because we have so much money tied up in those patterns.

Now, Pop, there isn't a pattern in that whole building that can't be reproduced as a finished product by 'Stable-Arc' welded steel—for less money than a finished casting—in less time and when finished it will give far more strength. And all you'll have to house is a dimension sketch which costs just a fraction of a pattern.

A pattern used to be called 'Something to GO by.'

Today it's something to go BY—very fast."

A new textbook on Arc Welding (Price $1.50) will be sent on approval for five days to any executive requesting it.

Book size, 6" x 9"—total pages, 160—number of illustrations, 200—Charts, 62—Divisions, 8.

The Lincoln Electric Co., Dept. No. 20-12, Cleveland, Ohio

W-4

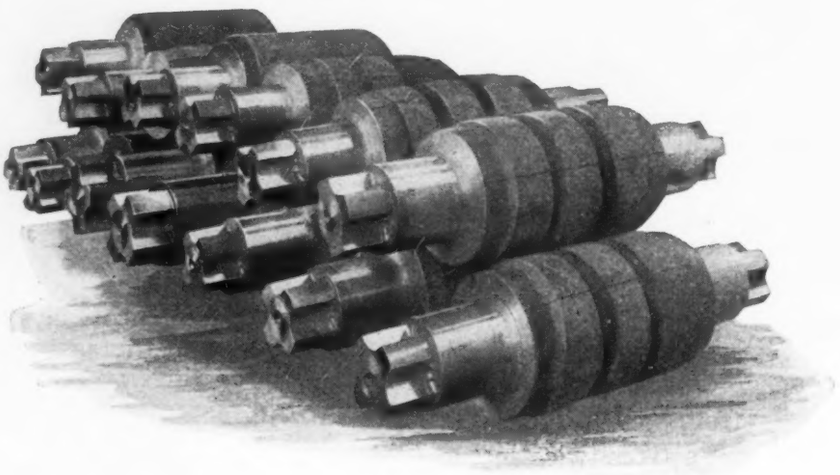
"Stable-Arc" LINCOLN WELDER

ADAMITE

PATENTED

The Wear Resisting Alloy

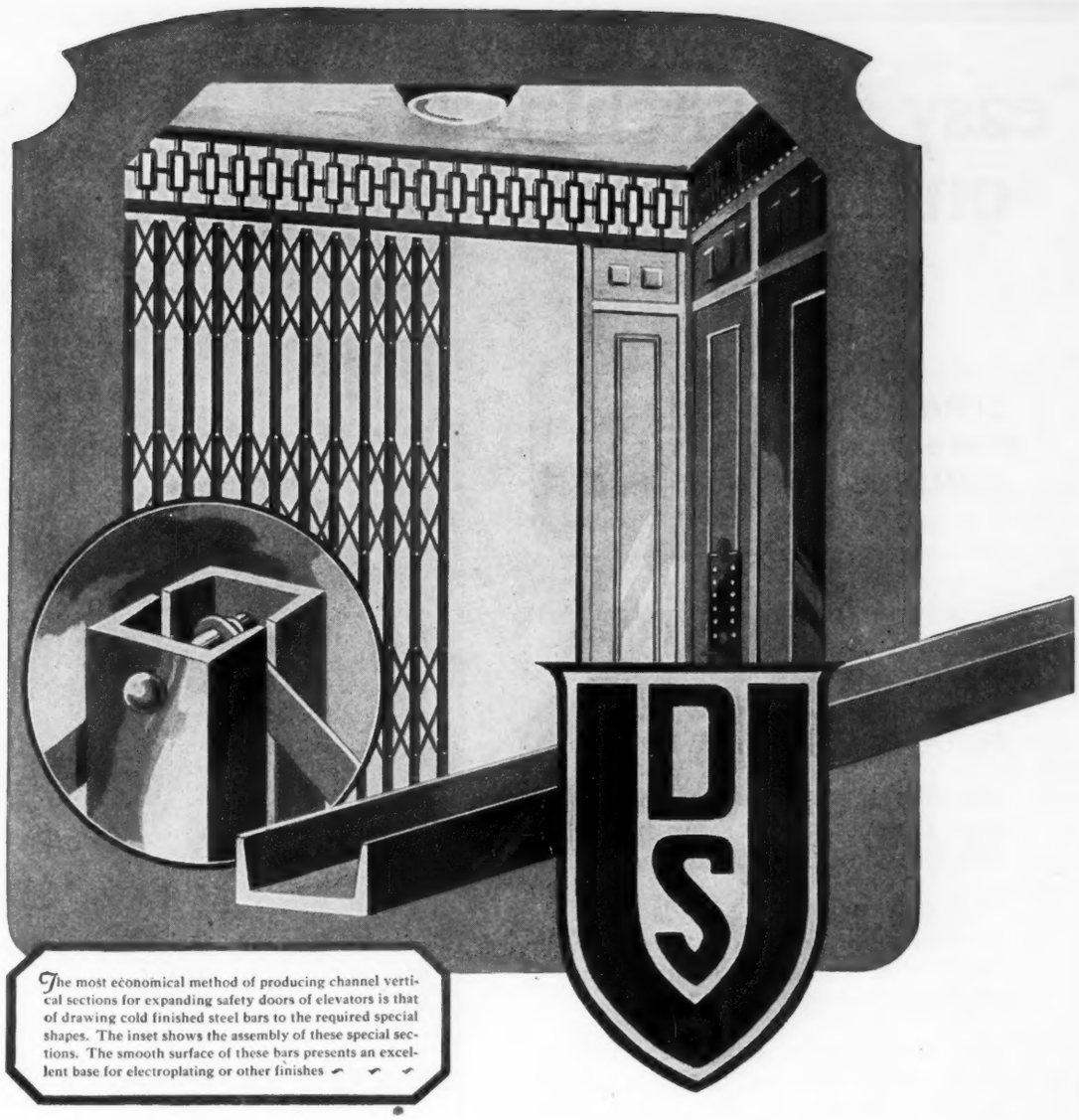
STANDS SUPREME



The first alloy roll to set a standard for the roll buyer and roll manufacturer. Performance figures continually piling up are proof that "Adamite" stands supreme.

ADAMITE ROLLS AND HEAVY DUTY CASTINGS

Sole Manufacturers { Mackintosh-Hemphill Co. / United Engineering & Foundry Co. } *Pittsburgh, Pa.*



The most economical method of producing channel vertical sections for expanding safety doors of elevators is that of drawing cold finished steel bars to the required special shapes. The inset shows the assembly of these special sections. The smooth surface of these bars presents an excellent base for electroplating or other finishes

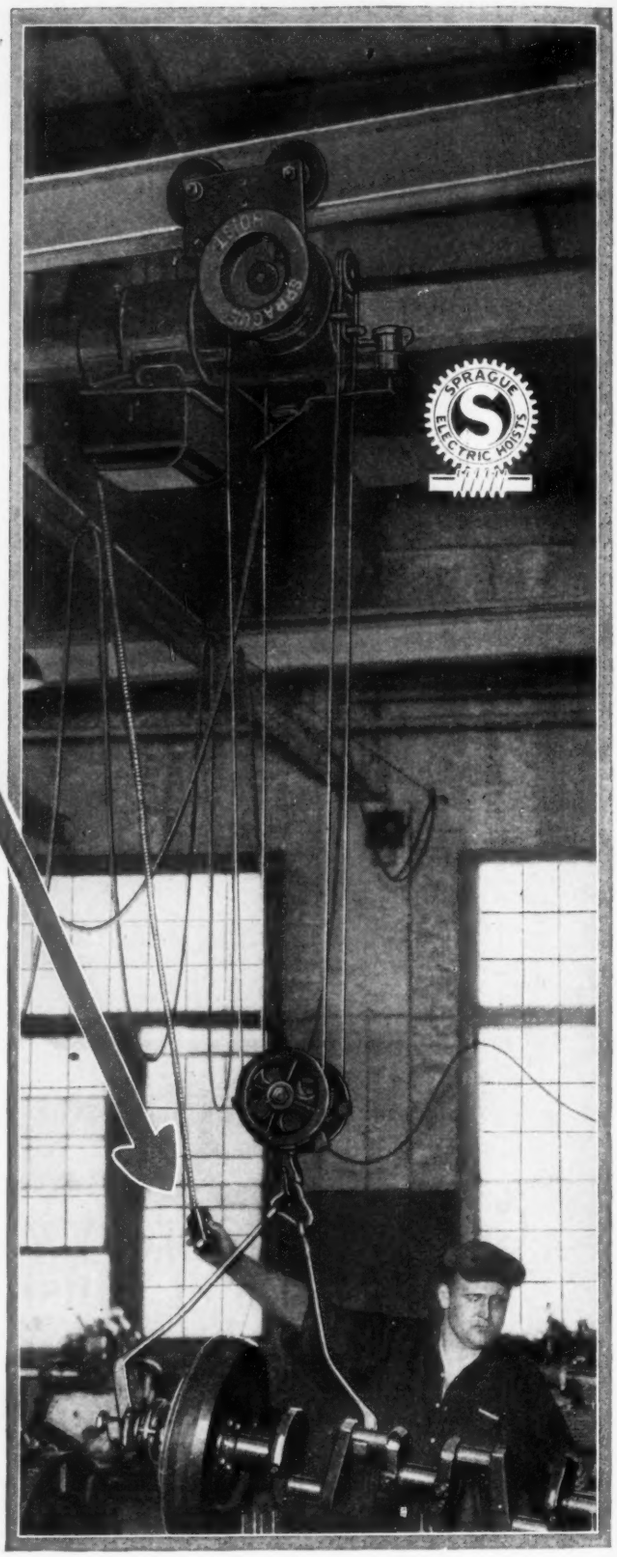
Economy, accuracy *and* durability are the essentials of finished production that have developed such wide utility *for* Union Drawn Steels in special shapes

UNION DRAWN STEEL CO. *Beaver Falls, Pa.*

UNION DRAWN STEELS

"easy as switching on the lights"

SPRAGUE
PUSH BUTTON
CONTROL



Press a button for "up", press a button for "down".

Jog the load a fraction of an inch if necessary—or run it the full length of the hoisting cable.

You can manipulate loads with a remarkable degree of precision when you use a Sprague Push Button Control Hoist.

The push button station is held in one hand, allowing a free hand to guide the load. It may also be installed at a remote point, if necessary.

These hoists are supplied in ¼, ½, 1, 2, 3, 4, 5 and 6 tons capacities for direct or alternating current. They have worm gearing (simplicity in itself), automatic lubrication, are thoroughly enclosed, and will give you a reliable year in and year out service.

Let us quote on your hoist requirements.

SPRAGUE ELECTRIC HOISTS

DIVISION OF
SHEPARD ELECTRIC CRANE & HOIST CO.

30 CHURCH ST. NEW YORK, N.Y.

Cameron Pumps

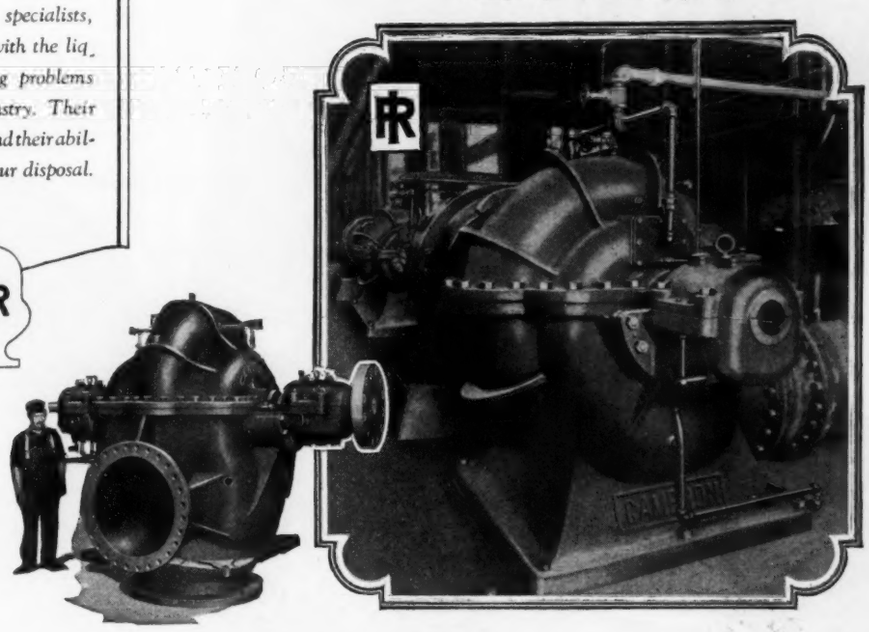
Where "revolutions per minute" means nothing—

By stepping from tread to tread on his small paddle-wheel, the Japanese farmer slowly and laboriously turns water into his rice field. The creaking, uncertain old tread-wheel with its perspiring human motor is the primitive counterpart of the smooth-running, efficient impeller of the modern pump.

Imagine how many such century-old contrivances it would require to equal the capacity of a single Cameron Pump.

INGERSOLL-RAND COMPANY
A. S. CAMERON STEAM PUMP WORKS
11 Broadway New York City
Offices in principal cities the world over
For Canada Refer—Canadian Ingersoll-Rand Co., Limited
10 Phillips Square, Montreal, Quebec

Cameron Engineers are pump specialists, conversant with the liquid handling problems of every industry. Their experience and their ability are at your disposal.



Cameron Circulating Water Pump

278-DV

Ingersoll-Rand

A. S. Cameron Steam Pump Works

Throw 'er over — *that's all*

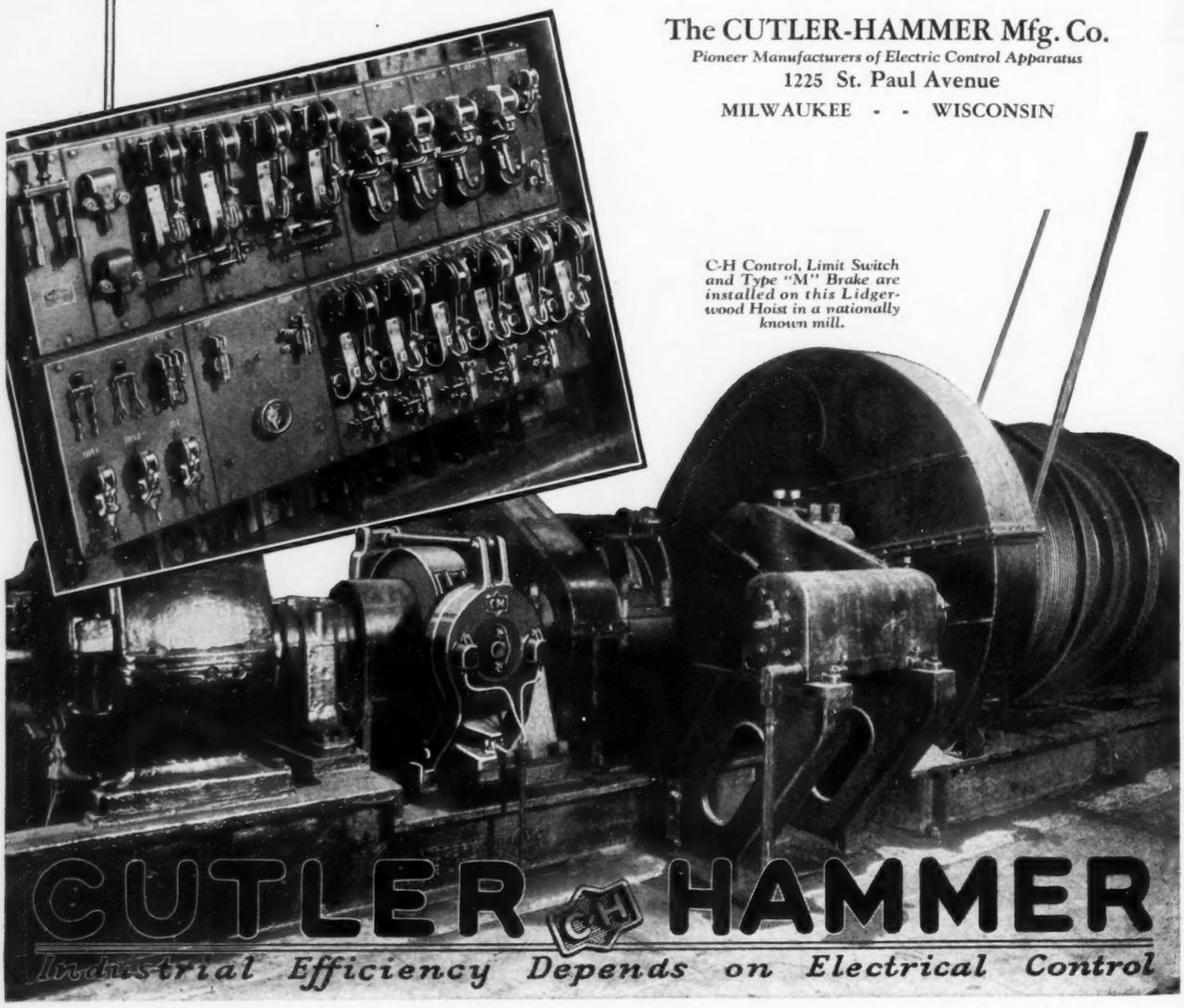
C-H Control takes care of the hoist

WHEN the blast furnace skip hoist is C-H controlled—just throw the "master" handle. That one simple gesture puts C-H Control in command. And C-H Control sees things through from start to finish without a lost moment, with unfailing protection to motor and equipment—with an accuracy and dependability of performance that the most skilled workman could not match with ordinary motor control.

C-H controlled, the skip gets away speedily—but safely. At the correct instant it slows down. A moment later: with uncanny accuracy the motor stops, a C-H Magnetic Brake is set and the skip is dumped. C-H Limit Switches similar to those controlling the movement of the skip also operate the big and little bells to afford any charging sequence desired. Reversing the "master" starts the empty skip back and a loaded one up—a cycle that can be repeated hour after hour for years without a wasted moment.

Considering the importance of efficient hoist operation, most plants consult C-H Engineers regarding their requirements.

The CUTLER-HAMMER Mfg. Co.
Pioneer Manufacturers of Electric Control Apparatus
1225 St. Paul Avenue
MILWAUKEE - - WISCONSIN



C-H Control, Limit Switch and Type "M" Brake are installed on this Lidgerwood Hoist in a nationally known mill.

Electromet Service

The service rendered to users of ELECTROMET alloys assures them of prompt shipment of their orders from stock. ELECTROMET service also affords the help of our metallurgical staff in solving your manufacturing problems.

The properties and uses of ELECTROMET alloys and metals are described in a booklet which we shall be glad to send you on request.

Sole Distributors
ELECTRO METALLURGICAL SALES CORPORATION
Unit of Union Carbide and Carbon Corporation
Carbide and Carbon Building, 30 E. 42d St., New York

Electromet Brand *Ferro-Alloys and Metals*

CHROMIUM
- High Carbon Ferrochrome (maximum 6% carbon)
- Low Carbon Ferrochrome (in grades, maximum 0.10% to maximum 2.00% carbon)
- Chromium Metal
- Chromium-Copper
- Miscellaneous Chromium Alloys

MANGANESE
- Standard Ferromanganese 78 to 82%
- Low Carbon Ferromanganese
- Manganese Metal
- Manganese-Silicon
- Manganese-Copper
- Miscellaneous Manganese Alloys

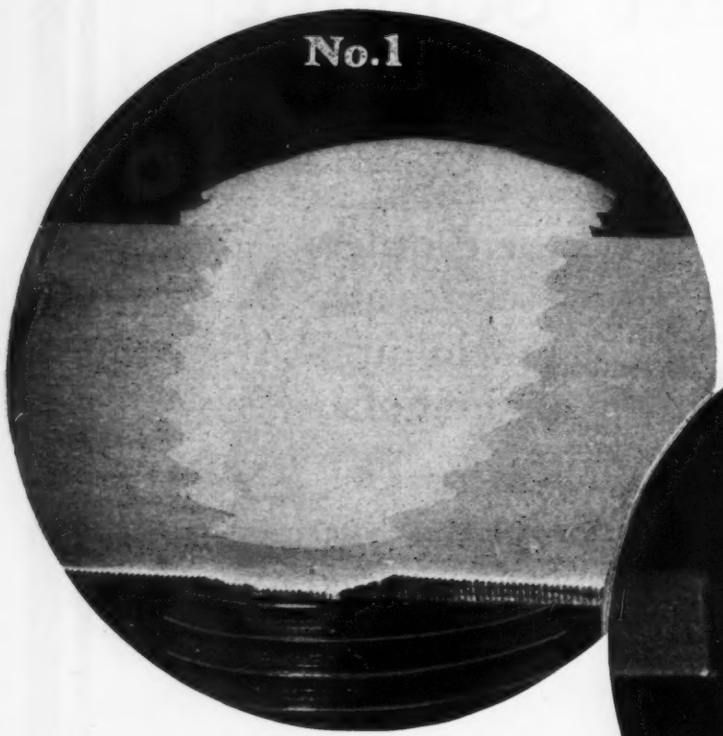
SILICON
- Ferrosilicon 15%
- Ferrosilicon 50%
- Ferrosilicon 75%
- Ferrosilicon 80 to 85%
- Ferrosilicon 90 to 95%
- Refined Silicon (minimum 97% silicon)
- Calcium-Silicon
- Silicon-Copper
- Manganese-Silicon
- Silico-Manganese
- Miscellaneous Silicon Alloys

VANADIUM
- All Grades

ZIRCONIUM
- Silicon-Zirconium
- Zirconium-Ferrosilicon

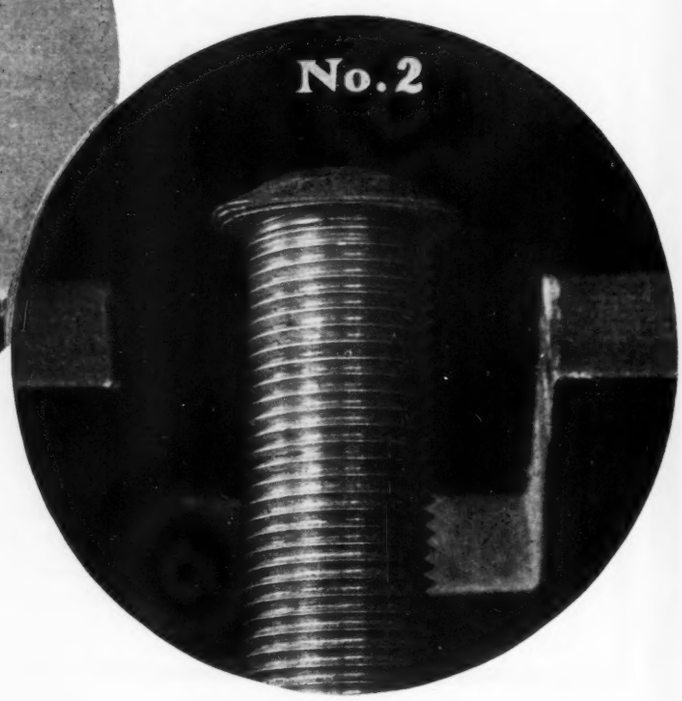
CLIMAX ALLOY STEEL
STAY-BOLTS
THE FOE OF VIBRATION AND CORROSION

High Staybolt Efficiency Revealed by Tests



No. 1

CLOSE up photo shows the bolt and sheet section cut away at a 45° angle in order to permit of the most critical inspection — at this angle more of each thread is shown, and naturally imperfections or faulty junction of the bolt and plate metal would be more obvious than in a right angle cut.



No. 2

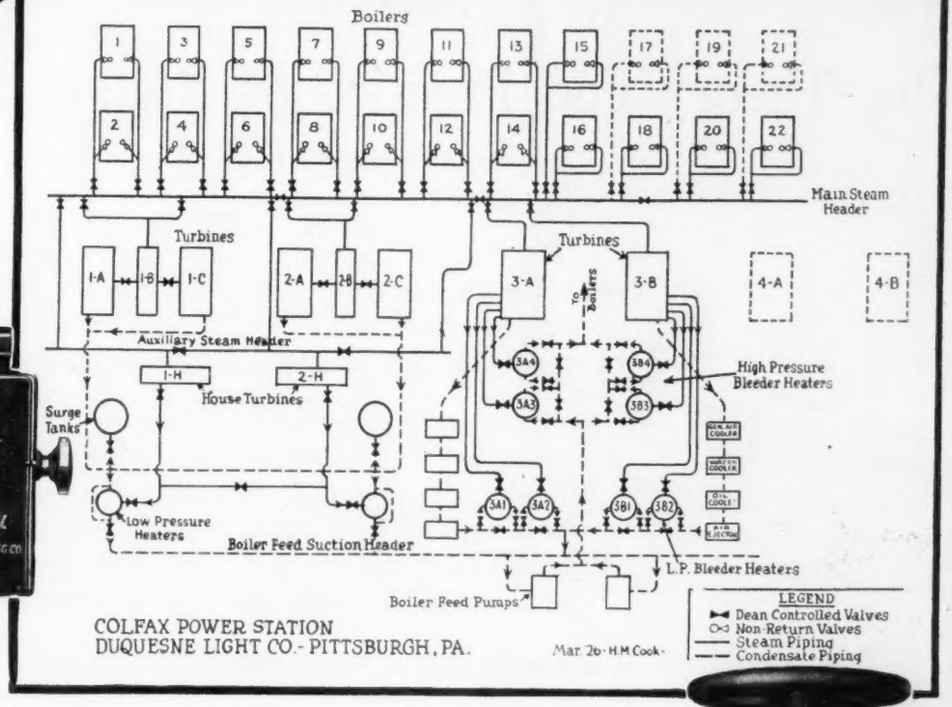
SHOWING bolt after plate has been removed. Diameter gauge indicated an expansion of twenty thousandths of an inch between the first and ninth thread, after driving head up cold.

IN the above tests to determine the higher efficiency of "Climax" Alloy Steel Staybolts not a sign of any checks or cracks were developed either in the cold driven up heads or on the threaded portions of the bolts screwed into the plates. These tests were made from staybolts taken from the regular production going through the plant—the same kind of staybolts that are everywhere making new records for greater economy by cutting down replacement cost and increasing locomotive revenue earning hours. The fact is "Climax" Alloy Steel is a highly specialized product of superior worth. This is because of its ability to better resist for a longer period the destructive forces that mean short life to all ordinary staybolts. In thin sheets where only a few full threads are in contact with the plate the inbuilt properties of "Climax" insure a perfect steam tight joint.

THE BOURNE-FULLER CO.
CLEVELAND, OHIO
Makers of "Upson Bolts" - The Result of Over 70 Years Specialization

101 C-H Valve Control Units

C-H Valve Control Units can be placed wherever convenient, or safe—can be grouped on a panel if desired.



...make this modern plant efficient, safe

C-H Valve Operating Units can be installed on any valve.

ONE of the leading power plants in the country operates 101 valves with C-H Motor Operating Valve Units. This endorsement by such extensive use followed the rigid test of performance. C-H Valve Control System proved more efficient, safer than hand operation could possibly be.

Any valve, in any location, responds instantly to the touch of a finger to the control station which is placed in a convenient, safe spot. Valve operation is a matter of seconds and where needed, "fool-proof" interlocks can be arranged for following any desired sequence of valve operation.

Isn't a thorough investigation of such valve control well worth while? Just write for the booklet "Modern Valve Control Practice".

The CUTLER-HAMMER Mfg. Co.

Pioneer Manufacturers of Electric Control Apparatus

1225 St. Paul Avenue - MILWAUKEE, WISCONSIN

Quick change-over on the air-blast

Should a blower fail, minutes count. With C-H Valve Control the "stand-by" blower can be "cut-in" so quickly that the furnace crew won't realize the shift has been made. And by electrically interlocking the feed and discharge valves change-overs are effected almost automatically, and with less chance of error.

CUTLER C-H HAMMER

Dean Valve Control System

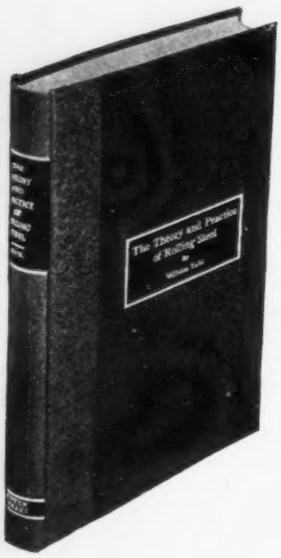
A Complete Treatise on Rolling Mill Practice

That's

"The Theory and Practice of Rolling Steel"

By Prof. Wilhelm Tafel

(Translated by Richard Rimbach)



Here's a book that covers every angle of the design, construction and operation of the steel rolling mill—the only book of its kind that has ever been written.

It discusses every phase and problem of rolling mill and roll design from blooming mill to the most intricate shapes. It deals with spreading, forward slippage, gripping, side work and every one of the problems involved in rolling every kind of rolled steel product made, and all in the most clear and thorough fashion.

It is a book that it would pay every mill superintendent or foreman, every roll designer or turner, every steel works engineer, and all executives and operating officials to have—a complete authoritative encyclopedia on every phase of rolling steel.

Your name and address on the coupon below will bring a copy right to your desk.

Price, Postpaid

$6.00 in the United States and Canada **30s. in all other countries**

Buyers in Europe can secure copies promptly by ordering from our London Office, 2-3 Caxton House, Westminster, London, S.W.1. where a stock of the books is available.

USE THIS COUPON

THE PENTON PUBLISHING CO.
Book Department
Penton Bldg., Lakeside Ave. & W. 3rd St.
CLEVELAND, O.

Date .....

Enclosed is { $6.00 / 30s. } for which please send, all charges prepaid, one copy of the ***"Theory and Practice of Rolling Steel"*** by Wilhelm Tafel.

Name.....

Address.....

102 I.F.

This Kind of PIPE GIVES BETTER SERVICE

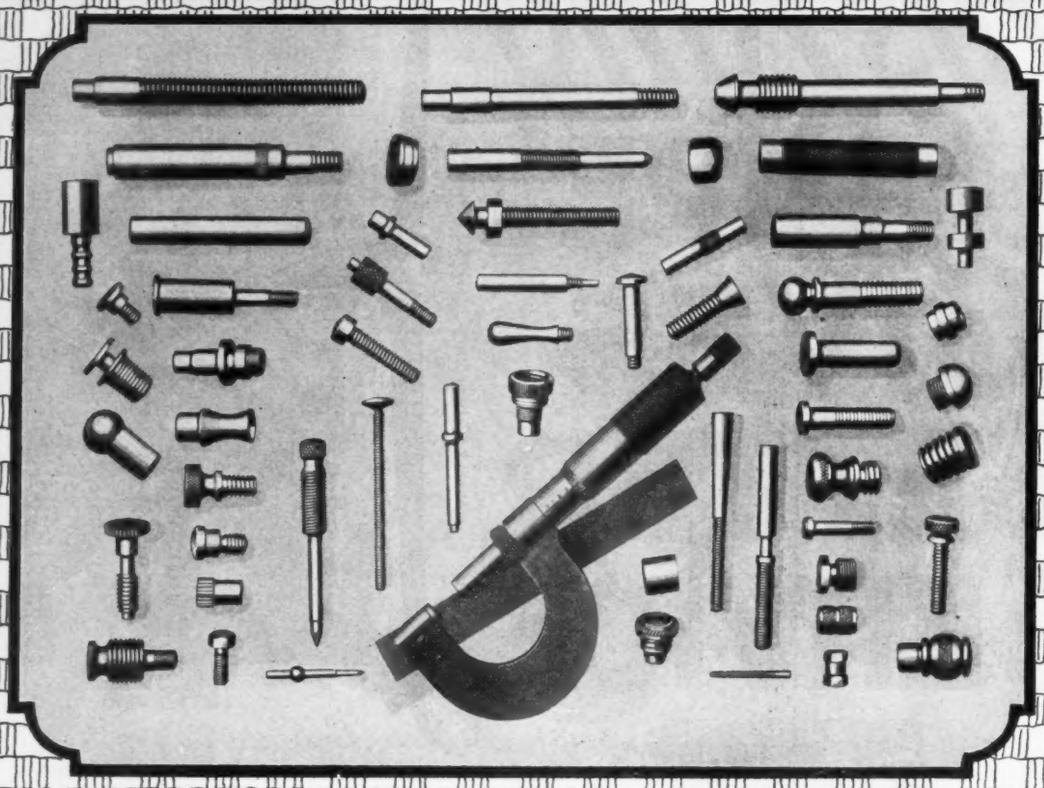
"NATIONAL" Pipe (butt-weld sizes ½ to 3-inch) is made by the Scale Free Process—an exclusive feature applied only to this pipe. This process consists of special rolling operations that remove the mill-scale (see pipe at left) from the pipe walls, leaving clean, smooth surfaces (see pipe above)—with the following advantages in service:

1. *Less corrosion—particularly pitting.* Mill-scale is one of the principal causes of pitting; it is electronegative to the pipe metal and sets up galvanic action causing pitting around the scale areas—therefore, when scale is removed, longer life is obtained from the pipe.
2. *Clean, smooth surfaces* — forming a better base for galvanizing or other protective coatings.
3. *Full delivery capacity*—less friction loss, because there are no obstructions to the flow.
4. *No clogging of valves or small orifices* — because there is no scale in the pipe to break off.
5. *Greater strength at the weld.* The additional rolling which scale free pipe receives, increases its strength at the weld approximately 20 per cent.

We will be glad to send Bulletin No. 7, which explains the advantages of Scale Free Pipe—the pipe that is specially made to resist corrosion.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

District Sales Offices in The Larger Cities



Namco Parts Cost You Less

When you order screw machine products from Namco you make the specifications and we do the work. You have no raw material to buy, no tools to make, no gages to bother with—in other words ***no production problem.***

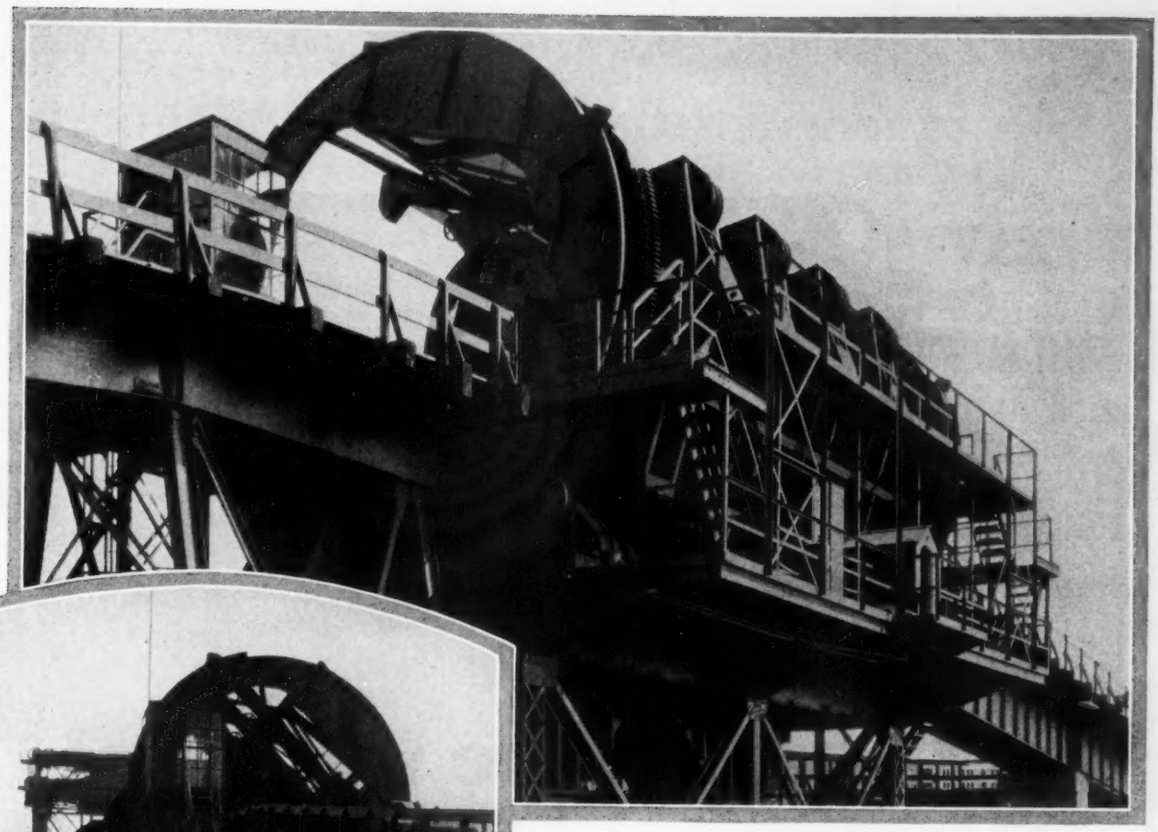
With all this you will get better products than you yourself could produce (except at great trouble and expense) at a cost far below what you could make it in your own plant.

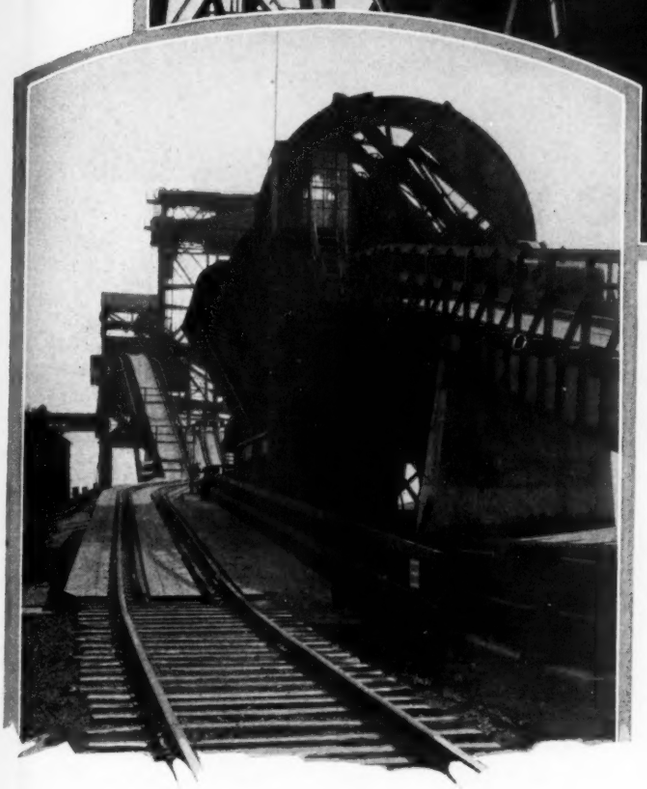
For nearly thirty years the Namco organization (known the world over as one of screw machine specialists) has concentrated upon the manufacture of screw machine products from the simplest "standards" to the most complicated "specials." ***That is why we know how.***

The National Acme Company

Cleveland, Ohio

New York Detroit Chicago





W-S-M Revolving CAR DUMPER doubles coal handling capacity—

of the Western Maryland Railway's coal pier at Baltimore.

If your problems involve the loading or unloading of coal, ore, etc., consult W-S-M Engineers. We can design and build efficient and economical equipment to suit your particular needs.

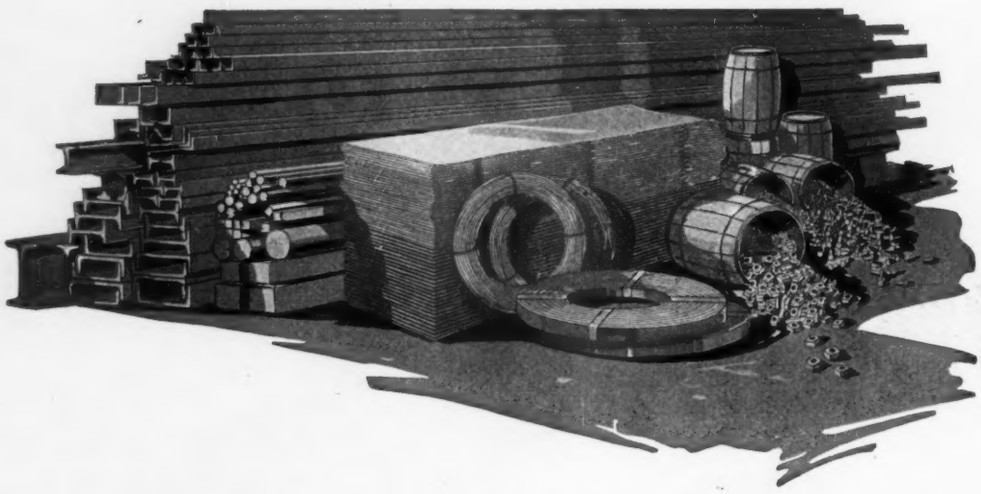
THE WELLMAN-SEAVER-MORGAN CO.

ENGINEERS CONSTRUCTORS MANUFACTURERS

Cleveland, Ohio

New York at 522 Fifth Avenue. Birmingham at 1101 American Trust Bldg.

In Canada, the Canadian Wellman-Seaver-Morgan Co., Ltd., 307 Reford Bldg., Toronto; 808 Drummond Bldg., Montreal.



Your Source for Steel

RYERSON Steel-Service stands for the immediate shipment of everything in iron and steel. No order is too small to receive careful attention or too large to be handled promptly.

There is no uncertainty or delay—no costly waiting. When you purchase steel from one of the eight Ryerson Steel-Service Plants you can depend upon quick action. Your letter, 'phone call or telegram will start the steel on its way.

The Ryerson Journal and Stock List is the "key" to Immediate Steel—Write for your copy.

Bars	Plates	Boiler Tubes and Fittings
Shapes	Sheets	Reinforcing Steel
Structurals	Rivets	Firmtread Plates
Rails	Bolts	Alloy Steel
Shafting	Wire	Ascoloy
Strip Steel	Chain	Tool Steel
Turnbuckles	Forging Bars	Small Tools
Babbitt	Billets	Machinery, etc.
Refined Iron	Welding Rod	

JOSEPH T. RYERSON & SON INC.
ESTABLISHED 1842

PLANTS: CHICAGO ST. LOUIS CLEVELAND JERSEY CITY MILWAUKEE CINCINNATI DETROIT BUFFALO BOSTON

REPRESENTATION IN DENVER SAN FRANCISCO NEW YORK MINNEAPOLIS TULSA HOUSTON LOS ANGELES NEWARK

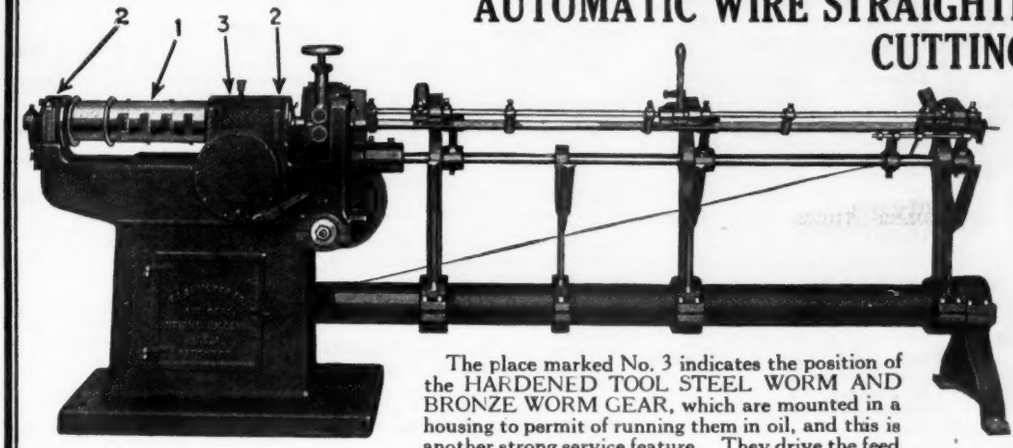
RYERSON STEEL-SERVICE

Steel Straightening Arbor (marked 1)
Mounted in Timken Roller Bearings (marked 2)

are only two of the points making for great durability in the

SHUSTER One Belt Driven

AUTOMATIC WIRE STRAIGHTENING AND CUTTING MACHINE shown here



The place marked No. 3 indicates the position of the HARDENED TOOL STEEL WORM AND BRONZE WORM GEAR, which are mounted in a housing to permit of running them in oil, and this is another strong service feature. They drive the feed and cut off from the arbor.

If you prefer motor driven, self contained machine, this may be readily adapted for it at slight expense.

The F. B. Shuster Company **New Haven, Conn.**

Straightener Specialists Since 1866

THE JOHNSON FRICTION CLUTCH

The Great Machine Tool Clutch

Write for White Catalog

THE CARLYLE JOHNSON MACHINE CO. MANCHESTER CONN.

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PIPE CUTTING AND THREADING MACHINES

where it is essential to have
Economy-Speed-Reliability
HAND—BELT—ELECTRIC
Ranges ¼-2 in. up to 8-16 in.

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316 Garden St., Bridgeport, Conn.

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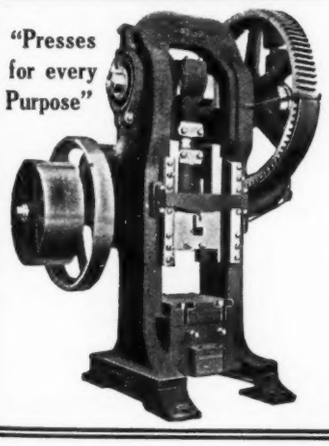
TAPPING DEVICES

Worcester, Mass.

Designers and Builders of
Continuous Wire Drawing Machines

Look for our full page advertisement in the first of each month.

"Presses for every Purpose"



The "TOLEDO" PRESSES

Cut the cost by producing, in the shortest time, a maximum amount of quality work.

The rigid, powerful *Straight Sided* presses have capacity for the heaviest classes of deep drawing, reducing and forming operations; for punching, piercing, stamping, etc., as well as for trimming drop forgings either hot or cold.

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Engineers, Founders and Machinists on Equipment for Sheet Metal Products.

Chicago Office:
549 West Washington Blvd.

Detroit Office:
Room 3—250 General Motors Bldg.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Alloy and Carbon Steel)
Andrews Steel Co., Newport, Ky.
Central Alloy Steel Corp., Massillon, O.

BILLETS (Die Stock Steel)
Andrews Steel Co., Newport, Ky.

BILLETS (Forging)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem, Steel Co., Bethlehem, Pa.

BILLETS (Re-Rolling)
Andrews Steel Co., Newport, Ky.

BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O.
Bethlehem Steel Co., Bethlehem Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Wood, Alan, Iron & Steel Co., Widener Bldg., Philadelphia, Pa.

BLANKS (Ring, Gear and Sprocket)
Akron-Selle Co., Akron, O.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

BLAST FURNACES — See FURNACES (Blast)

BLOWERS
General Electric Co., Schenectady, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York City.

BLOWERS (Rotary Positive)
Connersville Blower Co., The, Connersville, Ind.
Roots, P. H. & F. M., Co., Connersville, Ind.

BLOW PIPES (Brazing, Welding, Cutting, Etc.)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

BLUE PRINT FILES
Hamilton Mfg. Co., Two Rivers, Wis.

BOILERS
Combustion Engineering Corp., 200 Madison Ave., New York City.

BOILER HEADS
Bethlehem Steel Co., Bethlehem, Pa.

BOILERS AND SUPERHEATERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Sotter Bros., Inc., Pottstown, Pa.

BOILERS (Waste Heat)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILERS (Water Tube)
Babcock & Wilcox Co., The, 85 Liberty St., New York City.

BOILER SETTINGS AND CHIMNEYS
Rust Engineering Co., 311 Ross St., Pittsburgh, Pa.

BOILER TUBES — See TUBES (Boiler)

BOILER WALL COATING
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.

BOLT AND NUT MACHINERY
Landis Machine Co., Waynesboro, Pa.
National Machinery Co., Tiffin, O.

BOLTS
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Clark Bros. Bolt Co., Milldale, Conn.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Lake Erie Bolt & Nut Co., 915 E. 63rd St., Cleveland, O.
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.
Republic Iron & Steel Co., Youngstown, Ohio.
Rockford Bolt Co., 220 Mill St., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BOLTS (Acid Resisting)
Alcumite Corp., The, Dayton, Ohio.

BOLTS (Carriage)
Clark Bros. Bolt Co., Milldale, Conn.
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOLTS (Heat Treated)
Bethlehem Steel Co., Bethlehem, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.

BOLTS (Machine)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOLTS (Stove)
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.

BOLTS & NUTS (Brass & Bronze)
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

BOOKS (Technical)
Penton Publishing Co., Cleveland, O.

BORING MACHINES (Horizontal)
Diamond Clamp & Flask Co., Richmond, Ind.

BORING MILLS
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.

BOXES (Carbonizing)
Farrell-Cheek Steel Foundry Co., Sandusky, O.

BOXES (Open Hearth Charging)
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

BOXES (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BRAKES (Crane)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

BRAKES (Electric)
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

BRASS
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

BRICK (Silica, Magnesia, Chrome Fire Clay)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Stowe-Fuller Refractories Co., 1659 Union Trust Bldg., Cleveland, O.
U. S. Refractories Corp., Mt. Union, Pa.

BRICK INSULATING—See INSULATING BRICK

BRIDGE CRANES (Ore and Coal Handling)
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Eichleay, John, Jr., Co., S. 20th and Wharton, Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Morgan Engineering Co., Alliance, Ohio.
Mt. Vernon Bridge Co., Mt. Vernon, O.
Phoenix Bridge Co., 20 S. 15th St., Philadelphia, Pa.
Steel Plate Products Co., Pottstown, Pa.

BRONZE
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.

BRONZE (Centrifugally Cast)
Shenango-Penn Mold Co., Oliver Bldg., Pittsburgh, Pa.

BRONZE (Corrosive Resistant)
Alcumite Corp., The, Dayton, Ohio.
Hills-McCanna Co., 2349 Nelson Ave., Chicago, Ill.

BRONZE (Manganese)
Bethlehem Steel Co., Bethlehem, Pa.

BUCKETS (Clam Shell)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Sharpsburg P. O., Pittsburgh Pa.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Thew Shovel Co., The, Lorain, Ohio.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O
Williams, G. H., Co., 611 Haybarger Lane, Erie, Pa.

BUCKETS (Dumping)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

BUCKETS (Elevator)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.

BUCKETS (Grab)
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Brosius, Edgar E., Sharpsburg P. O., Pittsburgh, Pa.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Williams, G. H., Co., 611 Haybarger Lane, Erie, Pa.

BUILDINGS (Steel)—See BRIDGES, BUILDINGS, VIADUCTS, STACKS (Steel)

BULLDOZERS
Beatty Machine & Mfg. Co., Hammond, Ind.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.

BURNERS (Acetylene) — See TORCHES AND BLOWERS (Acetylene, Blow, Oxy-acetylene)

BURNERS (Automatically Regulated)
American Heat Economy Bureau, Inc., Wabash Bldg., Pittsburgh Pa.

BURNERS (Fuel, Oil, Gas and Combination)
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.

BURNERS (Oil)
Best, W. N., Corp., Sixth Ave and 31st St., New York City.

BY-PRODUCT PLANTS
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

CAN MAKING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.

CARBON BURNING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

CAR DUMPERS (Coal, Ore and Ash Handling Machinery)
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CAR PULLERS (Electric Capstan)
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.

CARS (Industrial and Mining)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.

CARS (Ingot and Open Hearth Charging)
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.

CASTINGS (Acid Resisting)
Alcumite Corp., The, Dayton, Ohio.
Cadman, A. W., Mfg. Co., 2814 Smallman St., Pittsburgh, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

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Gears, Pinions, Spindles, Coupling Boxes, Crab Couplings, Crane Wheels, Sheaves, Sprockets, Guides, Bending Dies, Shear Knives, etc.—

—are your guarantee of a big reduction in maintenance costs

The life of Stroh steel is six to ten times that of ordinary steel, assuring a long lasting investment and minimum maintenance cost.

Rolling Mill Parts

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STROH STEEL-HARDENING PROCESS CO.

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ROLLS

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AVONMORE, PA.

CASTINGS (Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Chicago Steel Foundry Co., Kedzie Ave. and 37th St., Chicago, Ill.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Sivyer Steel Casting Co., Milwaukee, Wis.
Treadwell Engineering Co., Easton, Pa.
Union Steel Castings Co., 62nd and Butler Sts., Pittsburgh, Pa.

CASTINGS (Bessemer Iron)
Valley Mould & Iron Corp., Hubbard, Ohio.

CASTINGS (Brass, Bronze, Copper, Aluminum)
American Abrasive Metals Co., 50 Church St., New York City.
Bethlehem Steel Co., Bethlehem, Pa.
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Enterprise Brass Works, Muskegon, Mich.
Hills-McCanna Co., 2349 Nelson Ave., Chicago, Ill.
Hill-Wallisch Bronze Co., 32d and Smallman Sts., Pittsburgh, Pa.
Mesta Machine Co., Homestead, Pa.

CASTINGS (Die) See DIE CASTINGS

CASTINGS (Electric Steel)
Chicago Steel Foundry Co., Kedzie Ave. & 37th St., Chicago, Ill.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co. Toledo, O.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Pittsburgh Electric Furnace Corp., P. O. Box 1125, Pittsburgh, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
West Steel Castings Co., The, 805 E. 70th St., Cleveland, O.

CASTINGS (Finished Brass)
Doehler Die Casting Co., Ninth & Court Sts., Brooklyn, N. Y.

CASTINGS (Gray Iron)
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Cascade Foundry Co., 19th & Plum Sts., Erie, Pa.
Cyclops Foundry Co., 1503 Union Bank Bldg., Pittsburgh, Pa.
Forest City-Walworth Run Foundries, W. 27th & Nickel Plate R. R., Cleveland, Ohio.
Lake Shore Engine Works, Marquette, Mich.
Machintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTINGS (Heat Resistant)
Farrel-Cheek Steel Foundry Co., Sandusky, O.

CASTINGS (Malleable)
Iowa Malleable Iron Co., Fairfield, Iowa.
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.
Marion Malleable Iron Works, Marion, Ind.
Meeker Foundry Co., Clay & Ogden Sts., Newark, N. J.
Newark Malleable Iron Works, Newark, N. J.
Oriskany Malliable Iron Co., Oriskany, N. Y.
Peoria Malleable Castings Co., Peoria, Ill.
Vermillion Malleable Iron Co., Hoopeston, Ill.

CASTINGS (Monel Metal)
Pittsburgh Valve, Foundry & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.

CASTINGS (Nickel Chromium)
Chicago Steel Foundry Co., Kedzie Ave. at 37th St., Chicago, Ill.

CASTINGS (Semisteel)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

CASTINGS (Steel)
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.
American Steel Foundries, 410 No. Michigan Ave., Chicago, Ill.
Atlas Steel Castings Co., 1963 Elmwood Ave., Buffalo, N. Y.
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Chicago Steel Foundry Co., Kedzie Ave. at 37th St., Chicago, Ill.
Columbia Steel Corp., Balfour Bldg., San Francisco, Calif.
Commercial Steel Castings Co., The, Marion, O.
Crucible Steel Castings Co., The, Almira and W. 84th St., Cleveland, O.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Industrial Steel Casting Co., Toledo, O.
Mackintosh-Hemphill Co., Pittsburgh, Pa.
Maynard Electric Steel Castings Co., 2-12 Kilbourn Rd., Milwaukee, Wis.
Mesta Machine Co., Homestead, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Roll & Foundry Co., The, Avonmore, Pa.
Nugent Steel Castings Co., 31st & Wood Sts., Chicago, Ill.
Reliance Steel Casting Co., 28th & Smallman Sts., Pittsburgh, Pa.
Sharon Foundry Co., Sharon, Pa.
Sivyer Steel Casting Co., Milwaukee, Wis.
Smith, George H., Steel Casting Co., Milwaukee Wis.
Stroh Steel Hardening Process Co., Westinghouse Bldg., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.
Treadwell Engineering Co., Easton, Pa.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh Pa.
West Steel Castings Co., The, 805 E. 70th St., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

CASTINGS (Worm & Gear Bronze)
Cadman, A. W., Mfg. Co. 2816 Smallman St., Pittsburgh, Pa.

CASTORS (Plate Mill)—See PLATE CASTORS

CEMENT (High Temperature)
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Quigley Furnace Specialties Co., 26 Cortland St., New York City.

CEMENT (Silica and Chrome)
General Refractories Co., 117 S. 16th St., Philadelphia, Pa.

CEMENT MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.

CENTRAL STATION EQUIPMENT
General Electric Co., Schenectady, N. Y.

CHAINS (Crane & Hoist)
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The, 265 Hosack St., Columbus, O.
Woodhouse Chain Co. Trenton, N. J.

CHAINS FOR ALL PURPOSES
American Chain Co., Bridgeport, Conn.
Carroll Chain Co., The. 265 Hosack St., Columbus, O.
Woodhouse Chain Works, Trenton, N. J.

CHAINS (Power Transmission)
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

CHANNELS—See STEEL (Structural)

CHAPLETS
Erdle Perforating Co., 171 York St., Rochester, N. Y.

CHARCOAL
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.

CHARGING MACHINES (Cupola)
Roots, P. H. & F. M., Co., Connersville, Ind.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CHEMICALS
American Chemical Paint Co., Ambler, Pa.
Ford, The J. B., Co., Wyandotte, Mich.

CHISEL BLANKS
Hunter Saw & Machine Co., 5656 Butler St., Pittsburgh, Pa.
Marchant, George F., Co., 1434 S. Rockwell St., Chicago, Ill.

CHROME ORE
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

CHROME VANADIUM
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.

CHROMIUM METAL
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.

CHUCKING MACHINES (Automatic, Multiple Spindle)
National Acme Co., E. 131st St. & Coit Rd., Cleveland, O.

CHUCKS (Grinding)
Heppenstall Forge & Knife Co., 47th & Hatfield, Pittsburgh, Pa.

CLAMPS (Plate Lifting)
Mirkil, Jr., Thos. H., Estate of, 1011 Chestnut St., Philadelphia, Pa.

CLEANERS (Metal)—See METAL CLEANERS

CLEANING SPECIALTIES
American Chemical Paint Co., Ambler, Pa.
Ford, The J. B., Co., Wyandotte, Mich.

CLUTCH CONES
Transue & Williams Steel Forging Corp., Alliance, O.

CLUTCHES
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Cut-Off Coupling)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.

CLUTCHES (Friction)
Johnson, Carlyle, Machine Co., The, Manchester, Conn.
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Ave., Chicago, Ill.

COAL AND COKE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Eaton, Rhodes & Co., First National Bank Bldg., Cincinnati, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Park & Williams, Real Estate Trust Bldg., Philadephia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Pilling & Co., Inc., 1500 Chestnut St., Philadelphia, Pa.
Pittsburgh Coal Co., Oliver Bldg., Pittsburgh, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Semet Solvay Co., 61 Broadway, New York City.
Snyder, W. P., Co., Oliver Bldg., Pittsburgh, Pa.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.
Tutein, E. Arthur, Inc., 100 Milk St., Boston, Mass.

COAL CRUSHERS AND PULVERIZERS
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

COAL, ORE and ASH HANDLING MACHINERY
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 So. Dearborn St., Chicago, Ill.
Sprague Electric Hoist Division of the Shepard Electric Crane & Hoist Co., 30 Church St., New York City.

COKE—See COAL AND COKE

COKE OVEN MACHINERY
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

COKE OVENS (By-Product)
Foundation Oven Corp., 120 Liberty St., New York City.
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.
Semet Solvay Co., 61 Broadway, New York City.

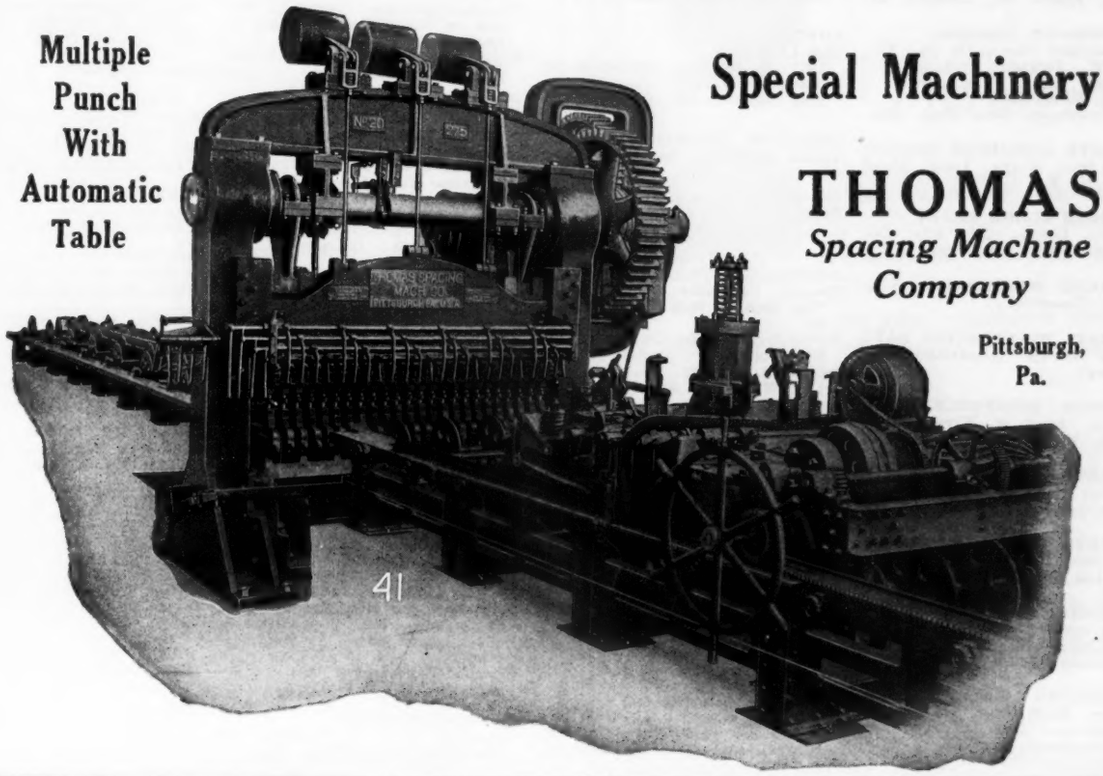
COMPENSATORS (Automatic)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

COMPRESSORS (Air)
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
General Electric Co., Schenectady, N. Y.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

Punching - Shearing - Spacing

Multiple Punch With Automatic Table



Special Machinery

THOMAS
Spacing Machine Company

Pittsburgh, Pa.

*

LEWIS

Chilled and Sand

ROLLS

For Iron, Steel, Brass, Copper, Aluminum, Zinc and Nickel.

For Hot Sheets, Tin Plate and strip.

For Cold Sheets, Tin Plate and Strip.

For Merchant Bars and Rods.

Rolling Mill Equipment *Special Machinery*

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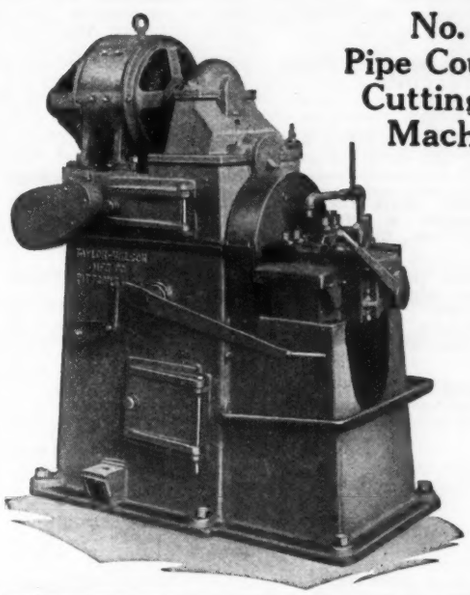
Lewis Foundry & Machine Co.
Pittsburgh, Pa.

Works at Groveton, Pa Phone—Coraopolis 20

No. 2 Pipe Coupling Cutting-Off Machine



PIPE MILL MACHINERY

Easily Operated
Accurate
Rapid

Taylor-Wilson Pipe Mill Machinery is the result of thirty years of experience in the manufacture and development of pipe threading machinery, and its service shows it. We shall gladly send full details.

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ENGINEERS—FOUNDERS—MACHINISTS
MAIN OFFICE AND WORKS (Pittsburgh District) McKEES ROCKS, PA.

*

COMPRESSORS (Air)—Continued
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.
Sullivan Machinery Co., 78 E. Adams St., Chicago, Ill.

COMPRESSORS (Portable)
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.

CONCRETE ARMORING (Surface)
Irving Iron Works, Long Island City, N. Y.

CONCRETE FLOOR SLABS
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

CONCRETE MIXERS—See MIXERS (Concrete)

CONCRETE REINFORCING BARS—See BARS (Concrete Reinforcing)

CONCRETE REINFORCEMENT
American Steel & Wire Co. 208 S. LaSalle St., Chicago, Ill.

CONCRETE ROOFING TILE
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

CONCRETE WATERPROOFING
Celite Products Co., 1820 S. Hope St., Los Angeles, Cal.

CONDENSATION MATERIAL (Laminated Phenolic)
Fibroc Insulation Co., Valparaiso, Ind.

CONDENSERS (Surface, Barometric, Multi-Jet)
Ingersoll-Rand Co., 11 Broadway, New York City.

CONDUITS (Electric)
Youngstown Sheet & Tube Co., Youngstown, O.

CONNECTING RODS
Transue & Williams Steel Forging Corp., Alliance, O.

CONTRACTORS—See ENGINEERS AND CONTRACTORS

CONTRACT WORK
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.

CONTROLLERS (Automatic)
Electric Controller & Mfg. Co., The, 2698 E. 79th., Cleveland, O.

CONTROLLERS (Electric)
Cutler-Hammer Mfg. Co., The, Milwaukee, Wis.
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONTROLLERS (Electric Crane)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONTROLLERS (Motor)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

CONVEYORS (Elevating and Conveying)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

COOLING BEDS
Morgan Construction Co., Worcester, Mass.

COPPER AND BRASS DRAWING MACHINERY
Vaughn Machinery Co., The, Cuyahoga Falls, O.

CORE MAKING MACHINES
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.

COTTER PINS
Hindley Mfg. Co., John St., Valley Falls, R. I.

COTTERS
Kirk-Latty Co., 1971 W. 85th St., Cleveland, O.
Lamson & Sessions Co., The, 2188 Scranton Rd., Cleveland, O.

COUNTING MACHINES
Veeder Mfg. Co., Hartford, Conn.

COUPLINGS (Carriage)
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.

COUPLINGS (Flexible)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
James, D. O., Mfg. Co., 1114 W. Monroe St., Chicago, Ill.

CRANES
Bedford Foundry & Machine Co., Bedford, Ind.
Cyclops Iron Works, 837 Folsom St., San Francisco, Calif.
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Milwaukee Electric Crane & Mfg. Co., Milwaukee, Wis.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.
Whiting Corp., Harvey, Ill.

CRANES (Charging)
Alliance Machine Co., The, Alliance, O.
Morgan Engineering Co., Alliance, O.
Wellman-Seaver-Morgan Co., The, 7025 Central Ave., Cleveland, O.

CRANES (Creeper, Erection)
Browning Crane Co., 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.
Thew Shovel Co., The, Lorain, Ohio.

CRANES (Electric Traveling)
Alliance Machine Co., The, Alliance, O.
Box Crane & Hoist Corp., Janney and E. Ontario Sts., Philadelphia, Pa.
Cleveland Crane & Engrg. Co., The, Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Morgan Engineering Co., The, Alliance, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.
Reliance Machinery Co., 1411 Brighton Rd., Pittsburgh, Pa.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

CRANES (Gantry)
Bedford Foundry & Machine Co., Bedford, Ind.
Cleveland Crane & Engineering Co., The, Wickliffe, O.
Whiting Corp., Harvey, Ill.

CRANES (Hand)
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.

CRANES (Hand Traveling)
Box Crane & Hoist Corp. Janney & E. Ontario Sts., Philadelphia, Pa.

CRANES (Hydraulic)
Alliance Machine Co., The, Alliance, O.

CRANES (Jib)
Box Crane & Hoist Corp., Janney & E. Ontario Sts., Philadelphia, Pa.
Cleveland Electric Tramrail, Division of the Cleveland Crane & Engineering Co., Wickliffe, O.
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANES (Locomotive)
Industrial Brownhoist Corp., 4403 St. Clair Ave., Cleveland, O.
Browning Crane Co., E. 162nd and Waterloo Rd., Cleveland, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.
Orton Crane & Shovel Co., 608 S. Dearborn St., Chicago, Ill.

CRANES (Portable)
Beatty Machine & Mfg. Co., Hammond, Ind.

CRANES (Wall)
Niles-Bement-Pond Co., 111 Broadway, New York City.

CRANK SHAFTS
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Transue & Williams Steel Forging Corp., Alliance, O.

CRIMPING MACHINES
Streine Tool & Mfg. Co., The, New Bremen, O.

CRUSHING, GRINDING AND PULVERIZING MACHINERY
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Fuller Lehigh Co., Fullerton, Pa.
Morgan Engineering Co., Alliance, O.

CUPRO-VANADIUM
Vanadium Corp. of America, 120 Broadway, New York City.

CUTTING AND WELDING APPARATUS—See WELDING AND CUTTING APPARATUS (Electric)

CUTTING AND WELDING (Oxy-Acetylene Process)—See WELDING AND CUTTING APPARATUS AND SUPPLIES (Oxy-Acetylene Process)

CYLINDERS (Acetylene) — See ACETYLENE IN CYLINDERS

CYLINDERS (Oxygen) — See OXYGEN IN CYLINDERS

CYLINDERS (Pressure)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

DECARBONIZING APPARATUS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

DEOXIDIZERS
Titanium Alloy Mfg. Co., The, Niagara Falls, N. Y.

DERRICKS
American Terry Derrick Co., South Kearney, N. J.

DIE BLOCKS
Bethlehem Steel Co., Bethlehem, Pa.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

DIE CASTINGS
Doehler Die Casting Co., Ninth and Court Sts., Brooklyn, N. Y.
Newton Die Casting Corp. 20 Bush Terminal, Brooklyn, N. Y.

DIE CASTINGS (Tin, Aluminum and Zinc Base Alloys)
Doehler Die Casting Co., Ninth and Court Sts., Brooklyn, N. Y.

DIE HEADS (Automatic)
Landis Machine Co., Waynesboro, Pa.

DIE HEADS (Self-Opening)
National Acme Co., E. 131st St. & Colt Rd., Cleveland, Ohio.
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

DIES
Barth Stamping & Machine Works, 3814 W. 34th St., Cleveland, O.
Bethlehem Steel Co., Bethlehem, Pa.
Niagara Machine & Tool Works, 685 Northland Ave., Buffalo, N. Y.
Toledo Machine & Tool Co., Toledo, O.
Vanadium Corp., of America, 120 Broadway, New York City.

DIES (Riveters)
Marchant, George F., Co., 1434 So. Rockwell St., Chicago, Ill.

DISPENSERS (Die Cast)
Doehler Die Casting Co., Ninth and Court Sts., Brooklyn, N. Y.

DOORS AND SHUTTERS (Steel Fire and Rolling)
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

DRAFTING ROOM EQUIPMENT
Hamilton Mfg. Co., Two Rivers, Wis.

DRAGLINES
Thew Shovel Co., The, Lorain, Ohio.
G. H. Williams Co. 611 Haybarger Lane, Erie, Pa.

DRAW BENCHES
Aetna-Standard Engineering Co., The, Youngstown, O.

DRAW BENCHES (Wire)
Vaughn Machinery Co., Cuyahoga Falls, O.

DRILLING MACHINES (Automatic)
Barnes Drill Co., Rockford, Ill.

DRILLING MACHINES (Vertical and Gang)
Barnes Drill Co., Rockford, Ill.

DRILL RODS—See Rods (Drill)

DRILLS (Electric)
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.

DRILLS (Pneumatic)
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRILLS (Rock)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, New York City.

DRIVE SCREWS (Hardened Metallic)
Parker-Kalon Corp., 200 Varick St., New York City.

DRIVES (Cut Herringbone Gears)
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y.
Mackintosh-Hemphill Co., 12th and Etna Sts., Pittsburgh, Pa.
Strong Steel Foundry Co., 33 Norris St., Buffalo, N. Y.

DRIVES (Gear, Rope)
Mesta Machine Co., Homestead, Pa.

DRYERS (Sand, Coal, Ores, Chemical, Etc.)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.

DUST ARRESTORS
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Pangborn Corp., P. O. Box 588, Hagerstown, Md.

DUST COLLECTING EQUIPMENT
Midwest Air Filters, Inc., Bradford, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

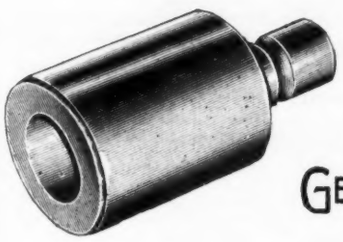
Heppenstall Mill Drives

Alloy Steel ◻ Carbon Steel
Heat Treated

Heppenstall Forge & Knife Co.
Pittsburgh, Pa.

HEPPENSTALL FORGE CO., Bridgeport, Conn. *Offices in principal cities* HEPPENSTALL STEEL CO., Detroit, Mich.

COMPRESSION RIVETER DIES
of "HEATPROOF" STEEL



Are guaranteed to outlast four carbon dies. They may be used continuously without cooling and recupped without annealing.

GEO. F. MARCHANT COMPANY
1434 So. Rockwell St.
CHICAGO

Valves and Fittings

This company makes a complete line of valves and fittings for every purpose. This enables you to centralize your purchases and is an advantageous factor in buying.

We will gladly send you the Jarecki Valve and Fitting Catalog on request.

(Established 1852)
Jarecki
Jarecki Manufacturing Company
Erie, Penna., U. S. A.

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DESIGNERS-MANUFACTURERS-CONTRACTORS
Electric Traveling Cranes, Rolling Mill Machinery, Steam Hammers, Steam Hydraulic Forging Presses, Hydraulic Presses, Rock Crushers, Machine work of all kinds. Special Machinery for any purpose.
THE MORGAN ENGINEERING CO., ALLIANCE, OHIO

The AETNA-STANDARD
ENGINEERING COMPANY
YOUNGSTOWN · OHIO
TUBE AND PIPE MILLS · TIN, STRIP AND SHEET MILLS · ROLLS

B R A D L E Y
CUSHIONED POWER HAMMERS
Equipped for Belt or Motor Drive. Let us tell you about them.
C. C. BRADLEY & SON INC.
SYRACUSE, N. Y.

ALLIS-CHALMERS
MILWAUKEE, WIS. U.S.A.
Power and Electrical Machinery, Steam, Gas and Oil Engines, Centrifugal Pumps, Condensers, Air Compressors, Power Transmission Machinery, Dust Collectors, etc.

Hydraulic Machinery
Automatic Gas Producers
R.D. WOOD & CO.
ESTABLISHED 1803
PHILADELPHIA, PA.
Catalogues mailed upon request

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Accurately Cut
ALL KINDS ALL MATERIALS
Dealing with us is a simple way of making sure of getting maximum gear value and service.
SIMONDS MANUFACTURING CO., Pittsburgh, Pa.

CLECO AIR TOOLS
ARE SPEEDY TOOLS
They Increase Production
— *We Manufacture* —
Riveting and Chipping Hammers, Air Drills, Portable Grinders, Corner Drills, Valve Grinders, Bowes Quick-acting Couplings, Cleco Pressure-seated Valves, etc.
Write for Catalog No. 28
THE CLEVELAND PNEUMATIC TOOL CO.
Cleveland, Ohio

ELECTRIC LUBRICATOR
Dot Lubricator Division-Carr Fastener Co., Cambridge, Mass.

ELECTRICAL EQUIPMENT
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.
General Electric Co., Schenectady, N. Y.

ELECTRIC TOOLS (Portable)—See TOOLS (Portable Electric)

ELEVATING AND CONVEYING MACHINERY—See CONVEYORS (Elevating and Conveying)

ELEVATORS (Bucket)
Bartlett, C. O., & Snow Co., 6213 Harvard Ave., Cleveland, O.
Link-Belt Co., 910 So. Michigan Ave., Chicago, Ill.

ENGINE LATHES—See LATHES (Engine)

ENGINES (Gas, Oil)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Ingersoll-Rand Co., 11 Broadway, New York City.

ENGINES (Heavy Duty)
Mesta Machine Co., Homestead, Pa.

ENGINEERS AND CONTRACTORS
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Chapman Engineering Co., Mt. Vernon, O.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Freyn Engineering Co., Chicago, Ill.
Hires, Castner and Harris, Inc., 25th and Morris Sts., Philadelphia, Pa.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
Laughlin, Alex, & Co., First National Bank Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Phoenix Bridge Co., 20 South 15th St., Philadelphia, Pa.
Pittsburgh Valve, Foundry & Construction Co., 26th & A. V. Ry., Pittsburgh, Pa.
Smythe, S. R., Co., The, House Bldg., Pittsburgh, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Swindell, Wm., & Bros., P. O. Box. 1753, Pittsburgh, Pa.

ENGINEERS (Consulting)
Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
Freyn Engineering Co., Chicago, Ill.
Kennedy, Julian, Bessemer Bldg., Pittsburgh, Pa.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.
Perin & Marshall, 40 West 40th St., New York City.
Shover, Barton R., 424 Oliver Bldg., Pittsburgh, Pa.

ENGINEERS, CONSULTING (By-Product Coke Oven and Gas Plants)
Koppers Construction Co., The, Union Trust Bldg., Pittsburgh, Pa.

EXHAUSTERS (Gas)—See GAS EXHAUSTERS

FACTORY EQUIPMENT (Steel)—See STOOLS AND FACTORY EQUIPMENT (Steel)

FACTORY SPECIALISTS
Fantus Factory Locating Service, 1825 S. Oakley St., Chicago, Ill.
Houston, David, Bond & Co., Inc., Military Park Bldg., 60 Park Place, Newark, N. J.
Technical Service Co., 233 Broadway, New York City.

FELTS (Wool Mechanical)
Booth Felt Co., Inc., The, 464 18th St., Brooklyn, N. Y.

FENCES—See WIRE FENCES

FERROALLOYS
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.

FERROCARBON TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

FERROCHROME
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.

FERROMANGANESE
Rogers Brown & Crocker Bros., Inc., 21 E. 42nd St., New York City.

FERROPHOSPHORUS
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROSILICON
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FERROVANADIUM
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Vanadium Corp. of America, 120 Broadway, New York City.

FILTERS (Air)
Midwest Air Filters, Inc. Bradford, Pa.

FIRE BRICK AND CLAY
Ashland Fire Brick Co., Ashland, Ky.
Brighton Fire Brick Co., Block House Run, New Brighton, Pa.
Climax Fire Brick Co., Climax, Pa.
Crescent Refractories Co., Curwensville, Clearfield Co., Pa.
Dover Fire Brick Co., 1012 Nat'l City Bank Bldg., Cleveland, O.
Elk Fire Brick Co., St. Marys, Pa.
Eureka Fire Brick Works, First National Bank Bldg., Pittsburgh, Pa.
Harbison-Walker Refractories Co., Farmers Bank Bldg., Pittsburgh, Pa.
Haws Refractories Co., Johnstown, Pa.
Kier Fire Brick Co., Oliver Bldg., Pittsburgh, Pa.
Laclede-Christy Clay Products Co., St. Louis, Mo.
Queen's Run Refractories Co., Inc., Lock Haven, Pa.
Savage Mountain Fire Brick Co., Frostburg, Md.
Taylor, Chas., Sons Co., The, Burns St., Cincinnati, Ohio.
Union Mining Co., 1113 Fidelity Bldg., Baltimore, Md.

FIRE CLAY (Ground)
General Refractories Co., 117 S. 16th., Philadelphia, Pa.
U. S. Refractories Corp., Mt. Union, Pa.

FIRE DOORS AND SHUTTERS
Kinnear Mfg. Co., The, 818-868 Field Ave., Columbus, O.
Moeschl-Edwards Const. Co., The, 120 W. 9th St., Covington, Ky.

FLANGES (Pipe)
Dart, E. M., Mfg. Co., Providence, R. I.

FLASKS (Snap)
American Foundry Equipment Co., 407 Byrkit Ave., Mishawaka, Ind.
Diamond Clamp & Flask Co., Richmond, Ind.

FLOORING—STEEL (Ventilating, Nonslipping, Fireproof)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

FLOOR PLATES (Rolled Steel)—See PLATES (Rolled Steel—Floor)

FLOOR PLATES (Safety, Non-Slipping)
American Abrasive Metals Co., 50 Church St., New York City.

FLUORSPAR
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

FLUX (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

FORGES (Heating)
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N .Y.

FORGING BILLETS—See BILLETS (Forging)

FORGING FURNACES
Best, W. N., Corp., Sixth Ave. and 31st St., New York City.
Chapman-Stein Furnace Co., Mt. Vernon, O.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.

FORGING MACHINERY
Bliss, E. W., Co., 53rd St. and 2nd Ave., Brooklyn, N. Y.
Bradley, C. C., & Son., Inc., 432 N. Franklin St., Syracuse, N. Y.

FORGINGS (Brass, Bronze and Copper)
American Brass Co., 25 Broadway, New York City.
Storms Drop Forging Co., Springfield, Mass.

FORGINGS (Drop)
Bay City Forge Co., Erie, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Canton Forge & Axle Co., 2001-2037 Dueber Ave., Canton, O.
Champion Machine & Forging Co., 3675 E. 78th St., Cleveland, O.
Drop Forging Co. of New York. 324 West Side Ave., Jersey City, N. J.
Eagle Bolt & Forging Co., The, 1435 E. 45th St., Cleveland, O.
Fruin Drop Forge Co., 343 West Root St., Chicago, Ill.
Heppenstall Forge & Knife Co., 47th & Hatfield Sts., Pittsburgh, Pa.
Oliver Iron & Steel Corp., So. 10th and Muriel Sts. Pittsburgh, Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Queen City Forging Co., The, 235 Tennyson St., Cincinnati, O.
Rockford Drop Forge Co., Rockford, Ill.
Storms Drop Forging Co., Springfield, Mass.
Strieby & Foote Co., 301 Ogden St., Newark, N. J.
Transue & Williams Steel Forging Co., Mechanicsburg, Pa.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.

FORGINGS (Hollow Bored)
National Forge & Ordnance Co., Irvine, Warren Co., Pa.

FORGINGS (Iron and Steel)
Bay City Forge Co., Erie, Pa.
Bethlehem Cteel Co., Bethlehem, Pa.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Drop Forging Co. of New York. 324 West Side Ave., Jersey City, N. J.
Heppenstall Forge & Knife Co., 47th and Hatfield Sts., Pittsburgh, Pa.
Leard, Wm., Co., The, New Brighton, Pa.
Mesta Machine Co., Homestead Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
National Forge & Ordnance Co. Irvine, Warren Co., Pa.
Philadelphia Steel & Iron Co., Commercial Trust Bldg., Philadelphia, Pa.
Rockford Drop Forge Co., Rockford, Ill.
Tioga Steel & Iron Co., Box 214, Easton, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.
Vanadium Corp. of America, 120 Broadway, New York City.
Williams, J. H., & Co., 400 Vulcan St., Buffalo, N. Y.
Neely Nut & Bolt Co.,

FORGINGS (Upset)
Neely Nut & Bolt Co., 2101 Wharton St., Pittsburgh, Pa.

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Whiting Corp., Harvey, Ill.

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Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

FROGS AND SWITCHES
Bethlehem Steel Co., Bethlehem, Pa.

FUEL OIL BURNING SYSTEMS
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FURNACE INSULATION
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 11 Broadway, New York City.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

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Best, W. N., Corp., Sixth Ave. and 31st St., New York City.
Chapman-Stein Furnace Co., Mt. Vernon, O.
Costello Engineering Co., 519 Oliver Bldg., Pittsburgh, Pa.
Hagan, George J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.
Westinghouse Electric & Mfg. Co., (Industrial Heating Dept.) Mansfield, Ohio.

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Brassert, H. A., & Co., 310 So. Michigan Ave., Chicago, Ill.
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O
Mt. Vernon Bridge Co., Mt. Vernon, O.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.

FURNACES (Continuous Pair)
Hagan, Geo. J., Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Surface Combustion Co., 2375 Dorr St., Toledo, Ohio.

FURNACES (Electric)
Hagan, George J. Co., Chamber of Commerce Bldg., Pittsburgh, Pa.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.
Swindell, Wm., & Brothers Co., P. O. Box 1753. Pittsburgh, Pa.
Westinghouse Electric & Mfg. Co., (Industrial Heating Dept.) Mansfield, Ohio.

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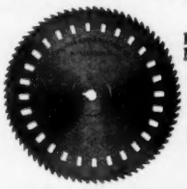

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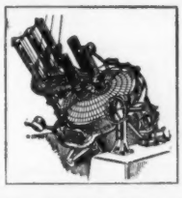

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Pittsburgh Electric Furnace Co.,
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Laughlin, Alex, & Co.,
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Pittsburgh, Pa.
Smythe, S. R., Co.,
Oliver Bldg., Pittsburgh, Pa.
Wellman-Seaver-Morgan Co., The,
7025 Central Ave., Cleveland, O.

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Hagan, Geo. J., Co., Chamber of
Commerce Bldg., Pittsburgh, Pa.

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519 Oliver Bldg., Pittsburgh, Pa.
Surface Combustion Co.,
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FURNACES (Steel Mill)
Rust Engineering Co.,
311 Ross St., Pittsburgh, Pa.

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Franklin Core Rod & Gagger Co.,
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Cattie Brothers Corp.,
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Gaul & Letterly Sts.,
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Hanlon-Gregory Galvanizing Co.,
5515 Butler St., Pittsburgh, Pa.

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Cattie, Joseph P., & Brothers,
Gaul & Letterly Sts.,
Philadelphia, Pa.
Gray-Gregory Galvanizing Co.,
220 Larkin St., Buffalo, N. Y.
Hanlon-Gregory Galvanizing Co.,
5515 Butler St., Pittsburgh, Pa.

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United Engineering & Foundry
Co., Farmers Bank Bldg., Pitts-
burgh, Pa.

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801 Beaver Ave., N.S., Pitts-
burgh, Pa.

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42nd St., New York City.

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nersville, Ind.

GAS EXHAUSTERS
Connersville Blower Co., The, Con-
nersville, Ind.

GAS METERS — See METERS (Gas, Air)

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Cooper, C. & G., Co., Mt. Ver-
non, O.
Duff Patents Co., Inc., 821 Union
Trust Bldg., Pittsburgh, Pa.
Flinn & Dreffein Co., 435 S.
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Koppers Construction Co., The,
Union Trust Bldg.,
Pittsburgh, Pa.
Morgan Construction Co., Worces-
ter, Mass.
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Co., Burlington, N. J.
Wellman-Seaver-Morgan Co., The,
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Wood, R. D., & Co., 400 Chest-
nut Ave., Philadelphia, Pa.

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Koppers Construction Co., The,
Union Trust Bldg.,
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Strong Steel Foundry Co.,
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Transue & Williams Steel Forging
Corp., Alliance, Ohio.

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344 Vulcan St., Buffalo, N. Y.

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Fibroc Insulation Co.,
Valparaiso, Ind.

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Fawcus Machine Co., 2818 Small-
man St., Pittsburgh, Pa.
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Jones, W. A., Foundry & Ma-
chine Co., 4437 W. Roosevelt
Ave., Chicago, Ill.
Taylor-Wilson Manufacturing Co.,
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Philadelphia Gear Works,
E. Tioga, Philadelphia, Pa.

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Manchester, Conn.

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man St., Pittsburgh, Pa.
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burgh, Pa.
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ter, Mass.
Niles-Bement-Pond Co., 111 Broad-
way, New York City.
Simonds Mfg. Co., 25th St. and
Liberty Ave., Pittsburgh, Pa.
Stroh Steel Hardening Process Co.,
Westinghouse Bldg., Pittsburgh,
Pa.
Taylor-Wilson Mfg. Co., McKees
Rocks, Pa.

GENERATING SETS
General Electric Co.,
Schenectady, N. Y.

GENERATORS (Acetylene) — See ACETYLENE GENERATORS

GENERATORS (Direct and Alternating Current)
General Electric Co.,
Schenectady, N. Y.

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Lincoln Electric Co., The, Colt Rd.
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lerton Ave., Chicago, Ill.

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Ransom Mfg. Co.,
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Smallman Sts., Pittsburgh, Pa.

GRINDING WHEELS
Norton Co., Worcester, Mass.

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Breese Bros. Co., The, 2347 Read-
ing Rd., Cincinnati, O.

GUARDS (Truck Radiator)
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Independent Pneumatic Tool Co.,
600 W. Jackson Blvd.,
Chicago, Ill.
Ingersoll-Rand Co.,
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Chambersburg Engineering Co.,
Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co.,
Alliance, Ohio.
Niles-Bement-Pond Co.,
111 Broadway, New York City.
Toledo Machine & Tool Co.,
Toledo, O.

HAMMERS (Forging)
Nazel Engineering & Machine
Works, 4041 N. 5th St., Philadel-
phia, Pa.

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Bradley, C. C., & Son, Inc., 482
No. Franklin St., Syracuse,
N. Y.
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Niles-Bement-Pond Co.,
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Sutton Engineering Co.,
Park Bldg., Pittsburgh, Pa.

HAMMERS (Steam)
Chambersburg Engineering Co.,
Chambersburg, Pa.
Erie Foundry Co., Erie, Pa.
Morgan Engineering Co.,
Alliance, O.

HANGERS (Door)
Myers, F. E., & Brothers Co., The,
Ashland, Ohio.

HANGERS (Shaft)
Hyatt Roller Bearing Co.,
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Shore Instrument & Mfg. Co.,
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Jamaica, N. Y.

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The, 5418 Lakeside Ave.,
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So. Kearney, N. J.
Industrial Brownhoist Corp.,
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O.
Shepard Electric Crane & Hoist
Co., 358 Schuyler Ave., Mon-
tour Falls, N. Y.
Sprague Electric Hoist Division
of the Shepard Electric Crane
& Hoist Co., 30 Church St.,
New York City.
Treadwell Engineering Co.,
Easton, Pa.

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Box Crane & Hoist Corp., Janney
& Ontario Sts., Philadelphia,
Pa.
Cleveland Electric Tramrail Divi-
sion of the Cleveland Crane &
Engineering Co., Wickliffe, O.
General Electric Co.,
Schenectady, N. Y.
Harnischfeger Corp., 3811 National
Ave., Milwaukee, Wis.
Roeper Crane & Hoist Works,
1729 No. 10th St., Reading, Pa.
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tour Falls, N. Y.
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& Hoist Co., 30 Church St.,
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Elston Ave., Chicago, Ill.
Ingersoll-Rand Co., 11 Broadway,
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Sullivan Machinery Co.,
78 E. Adams St., Chicago, Ill.

HOISTS (Portable)
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78 E. Adams St., Chicago, Ill.

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Chicago, Ill.
Migret, Rene,
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Charleroi, Belgium
Ryerson, Joseph T., & Son, Inc.,
16th and Rockwell Sts., Chi-
cago, Ill
West Leechburg Steel Co.,
Farmers Bank Bldg.,
Pittsburgh, Pa.

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Pa.

HOSE (Welding)
Oxweld Acetylene Co., 30 E. 42nd
St., New York City.

HOT BEDS
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Worcester, Mass.
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Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Chambersburg Engineering Co., Chambersburg, Pa.
Morgan Engineering Co., Alliance, O.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

HYDRAULIC PRESSES—See PRESSES (Hydraulic)

INDUSTRIAL HAULAGE EQUIPMENT
General Electric Co., Schenectady, N. Y.

INGOT MOLDS
Bethlehem Steel Co., Bethlehem, Pa.
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Shenango-Penn Mold Co., Oliver Bldg., Pittsburgh, Pa.
Valley Mould & Iron Corp., Hubbard, Ohio.

INSTRUMENTS (Electric, Indicating and Recording)
General Electric Co., Schenectady, N. Y.

INSULATING BLOCK
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.

INSULATING BRICK
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.
Quigley Furnace Specialties Co., 26 Cortland St., New York City.

INSULATING POWDER AND CEMENT
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite Products Co., 1320 So. Hope St., Los Angeles, Calif.

INSULATION (Furnace, Boiler Settings, Ovens, Steam Pipe, Etc.)
Armstrong Cork & Insulation Co., 101 24th St., Pittsburgh, Pa.
Celite - Products Co., 1320 So. Hope St., Los Angeles, Calif.
Quigley Furnace Specialties Co., 26 Cortlandt St., New York City.

IRON
Interstate Iron & Steel Co., 104 So. Michigan Ave., Chicago, Ill.
Newport Rolling Mill Co., Newport, Ky.

IRON (Bar)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.

IRON (Chain)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON (Engine Bolt)
Bethlehem Steel Co., Bethlehem, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON (Norway & Swedish)
Brown-Wales Co., 493 C St., Boston, Mass.
Stahleker Steel Corp., 19 Congress St., Boston, Mass.

IRON (Silvery)
Globe Iron Co., Jackson, O.
Keokuk Electro-Metals Co., Keokuk, Iowa.

IRON (Stainless)
Firth-Sterling Steel Co., McKeesport, Pa.

IRON (Staybolt)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Penn Iron & Steel Co., Creighton, Pa.

IRON ORE
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.
Hanna, The M. A., Co., Leader Bldg., Cleveland, O.
Hillman Coal & Coke Co., First National Bank Bldg., Pittsburgh, Pa.
Park & Williams, Inc., Real Estate Trust Bldg., Philadelphia, Pa.
Pickands, Mather & Co., Union Trust Bldg., Cleveland, O.
Quinn, Clement K., & Co., Duluth, Minn.
Samuel, Frank, & Co., Harrison Bldg., Philadelphia, Pa.
Snyder, W. P., & Co., Oliver Bldg., Pittsburgh, Pa.

JOISTS AND STUDS (Pressed Steel)
Central Alloy Steel Corp., Massillon, O.

KEYS (Finished Machine)
Morton Mfg. Co., Muskegon, Mich.

KEYWAY CUTTERS (Stationary & Portable)
Morton Mfg. Co., Muskegon, Mich.

KNIVES AND SHEAR BLADES —See SHEAR BLADES AND KNIVES

LADLES
Riter-Conley Co. Oliver Bldg., Pittsburgh, Pa.

LATH (Expanded Metal)
Central Alloy Steel Corp., Massillon, O.

LATHES
Manning, Maxwell & Moore, Inc., 100 E. 42nd St., New York City.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

LATHES (Roll Turning)
Aetna-Standard Engineering Co., The, Youngstown, Ohio.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

LATHES (Vertical Turret)
Bullard Machine Tool Co., Bridgeport, Conn.

LEAD BURNING
Dietzel Lead Burning Co., Keystone Bldg., Pittsburgh, Pa.

LEAD BURNING APPARATUS (Oxy-Acetylene)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

LEAD POTS
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Strong, Carlisle & Hammond Co., The, 1392 W. 3rd St., Cleveland, O.

LEATHER BELTING—See BELTING (Leather)

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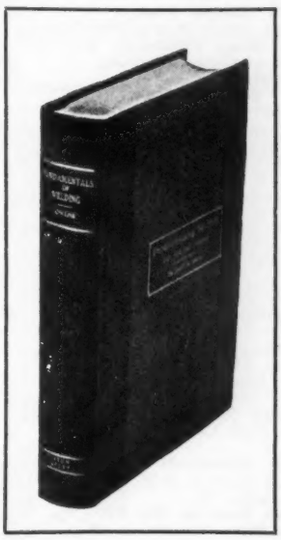

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SPECIAL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Bethlehem Steel Co., Bethlehem, Pa.
Bradley, C. C., & Son, Inc., 432 N. Franklin St., Syracuse, N. Y.
Morgan Engineering Co., Alliance, O.
National Roll & Foundry Co., Avonmore, Pa.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.
Tioga Steel & Iron Co., Box 214, Easton, Pa.
Treadwell Engineering Co., Easton, Pa.
Wellman-Seaver-Morgan Co., 7025 Central Ave., Cleveland, O.
Wheeling Mold & Foundry Co., Wheeling, W. Va.

SPECIAL SHAPES
Sharon Steel Hoop Co., Sharon, Pa.

SPECIAL SHAPES (Cold Drawn)
Keystone Drawn, Steel Co., Spring City, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.

SPEED REDUCERS
Jones, W. A., Foundry & Machine Co., 4437 W. Roosevelt Rd., Chicago, Ill.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

SPEED REDUCERS (Herringbone)
James, D. O., Mfg. Co., 1114 W. Monroe St., Chicago, Ill.

SPEED REDUCERS (Worm and Spur)
Philadelphia Gear Works, E. Tioga, Philadelphia, Pa.
James, D. O., Mfg. Co., 1114 W. Monroe St., Chicago, Ill.

SPIEGELEISEN
Rogers Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

SPIKES
Bethlehem Steel Co., Bethlehem, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

SPLICE BARS (Plain and Angle)
Sweet's Steel Co., Williamsport, Pa.

SPRING MAKING MACHINERY
Sleeper & Hartley, Inc., Worcester, Mass.

SPRINGS
American Spiral Spring & Mfg Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
American Steel & Wire Co., 208 So. LaSalle St., Chicago, Ill.
Barnes-Gibson-Raymond, Inc., 6400 Miller Ave., Detroit, Mich.
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Duer Spring & Mfg. Co., Pittsburgh, Pa.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.
Young, L. A., Industries, Inc., 9200 Russell St., Detroit, Mich.

SPRINGS (Car)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.

SPRINGS (Coil, Flat, Elliptic, Spiral)
American Spiral Spring & Mfg. Co., Arsenal Station, Pittsburgh, Pa.
American Spring & Mfg. Co., Elm St., Holly, Mich.
Barnes-Gibson-Raymond, Inc., 4200 Miller Ave., Detroit, Mich.
Bethlehem Steel Co., Bethlehem, Pa.
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.
Cook Spring Co., Ann Arbor, Mich.
Peterson Spring Co., The, 1660 Beard Ave., Detroit, Mich.
Raymond Mfg. Co., Centre St., Corry, Pa.
Young, L. A., Industries, Inc., 9200 Russell St., Detroit, Mich.

SPRUE CUTTERS
Shuster, The F. B., Co., New Haven, Conn.

STACKS (Steel)
American Bridge Co., The, 71 Broadway, New York City.
Sotter Bros., Inc., Pottstown, Pa.

STAMPINGS
American Spring & Mfg. Co., Elm St., Holly, Mich.
Barth Stamping & Machine Works, 3814 W. 34th St., Cleveland, O.
Bettcher Stamping & Mfg. Co., 3104 W. 61st St., Cleveland, O.
Breese Bros. Co., The, 2347 Reading Rd., Cincinnati, O.
Central Iron & Steel Co., Harrisburg, Pa.
Crosby Co., The, 183 Pratt St., Buffalo, N. Y.
G G G Metal Stamping Co., Dept. D, Warren, Pa.
Joliet Wrought Washer Co., Joliet, Ill.
Lansing Stamping Co., Lansing, Mich.
Motor Wheel Corp., Lansing, Mich.
Transue & Williams Steel Forging Corp., Alliance, O.
Wall, P., Mfg. Supply Co., Pittsburgh, Pa.

STAMPINGS (Aluminum, Bronze, Copper, Brass, Steel)
Akron-Selle Co., Akron, O.

STAMPS, STEEL AND MARKING DIES
Schwerdtle Stamp Co., 39 Cannon St., Bridgeport, Conn.

STARTERS (Electric Motor)
Electric Controller & Mfg. Co., 2698 E. 79th St., Cleveland, O.

STAYBOLTS
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEEL
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Birmingham, Ala.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Alloy)
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Firth-Sterling Steel Co., McKeesport, Pa.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Roller Bearing Co., The, Canton, O.
Vanadium Corp. of America, 120 Broadway, New York City.

STEEL (Alloy, Cold Drawn)
Timken Roller Bearing Co., The, Canton, O.
Union Drawn Steel Co., Beaver Falls, Pa.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

SHAW ELECTRIC TRAVELING CRANES

Capacities ranging from 2 TONS to 300 TONS

SHAW CRANE—PUTNAM MACHINE COMPANY

Ownership of Manning, Maxwell & Moore, Inc.

100 East 42nd Street, New York, N. Y.

Pittsburgh, Pa., Park Bldg.
Detroit, Mich., General Motors Bldg.
San Francisco, Cal., Overcamp Machinery Co.
Chicago, Ill., 27 N. Jefferson St.
St. Louis, Mo., Railway Exchange Bldg.
Seattle, Wash., Louis Walber Co.
Shaw Crane Works, Muskegon, Mich.

For Your Yard Work

P&H CORDUROY CRANES

Equipped with hook, bucket, clamshell or magnet, they can easily handle any kind of loose materials. Easily maneuvered on their Corduroy traction,—no tracks required.

HARNISCHFEGER CORPORATION
Successor to PAWLING & HARNISCHFEGER CO.
3811 National Ave., Milwaukee, Wis.

WHITING

ELECTRIC TRAVELING CRANES
FOUNDRY EQUIPMENT
WHITING CORPORATION
15643 LATHROP AVE., HARVEY, ILL.
RAILROAD SPECIALTIES

PUNCHING MACHINERY **BEATTY** SHEARING MACHINERY

PORTABLE CRANES

Multiple Punching Machines
Plate Shearing Machines
Bar Shearing Machines

Beatty Machine and Manufacturing Company
HAMMOND INDIANA

BEDFORD CRANES

Made in all capacities—Overhead or Gantry—to suit individual requirements. Floor, cage or remote control.
Bedford Steel Stiffleg or Guy Derricks.

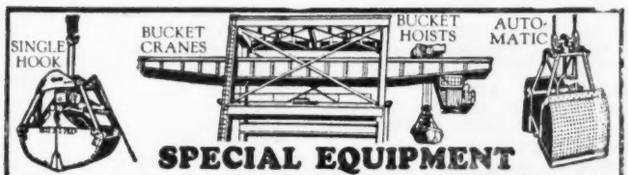
Bedford Foundry & Machine Co.
BEDFORD, IND.

Sturdy and Efficient

Roeper Type "R" Electric Hoist

Standard motor with single shaft extension; light in weight, strong and powerful; automatic stop; worm drive and one piece frame. Made in capacities 500 to 4000 lbs. Send for circular.

ROEPER CRANE & HOIST WORKS, Inc.
1729 North Tenth St. READING, PA.



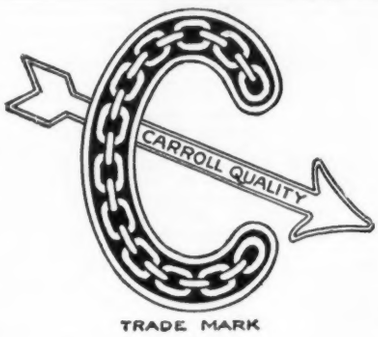
SPECIAL EQUIPMENT

Edgar E. Brosius, Inc. Engineers and Manufacturers SHARPSBURG P. O. PITTSBURGH, PA.

TERRY STEEL ERECTOR'S DERRICKS

Terry Derrick Fittings for general construction work.

AMERICAN-TERRY-DERRICK CO.
South Kearny, N. J.



TRADE MARK

DEPENDABLE WELDED CHAIN

Carroll Solid Weld—For Power Shovels and heavy duty
"DC" Dredge Quality—For Hoists, Cranes, Slings, etc.
Carroll Feed Chains—For coal cutting machines
Proof Coil, BB, BBB—For commercial or ordinary purposes

THE CARROLL CHAIN COMPANY, Columbus, Ohio

STEEL (Carbon)
Andrews Steel Co., Newport, Ky.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEEL (Case Hardened)
Jones & Laughlin Steel Corp., Pittsburgh, Pa.

STEEL (Cold Drawn)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Globe Wire Co., Sharpsburg, Pa.
Keystone Drawn Steel Co., Spring City, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Pittsburgh Tool Steel Wire Co., Monaca, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Products Co., Monaca, Pa.
Union Drawn Steel Co., Beaver Falls, Pa.
Wyckoff Drawn Steel Co., Pittsburgh, Pa.

STEEL (Crucible)
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Die)
Andrews Steel Co., Newport, Ky.

STEEL (High Speed)
Allen, Edgar, Steel Co., Inc., 718-722 W. Lake St., Chicago, Ill.
Firth-Sterling Steel Co., McKeesport, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Vanadium Alloys Steel Co., Latrobe, Pa.

STEEL (Open Hearth)
Andrews Steel Co., Newport, Ky.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Central Alloy Steel Corp., Massillon, O.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Timken Roller Bearing Co., The, Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

STEEL (Open-Hearth—Cold Drawn)
Union Drawn Steel Co., Beaver Falls, Pa.

STEEL (Rustless)
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Screw Stock)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Superior Steel Products Co., Monaca, Pa.

STEEL (Special Analysis)
Andrews Steel Co., Newport, Ky.

STEEL (Spring)
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

STEEL (Stainless)
Firth-Sterling Steel Co., McKeesport, Pa.

STEEL (Stamping and Drawing)
American Rolling Mill Co., Middletown, O.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.

STEEL (Staybolt)
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.

STEEL (Strip, Hot and Cold Rolled)
Acme Steel Co., 2849 Archer Ave., Chicago, Ill.
American Rolling Mill Co., Middletown, O.
American Steel & Wire Co., 208 S. LaSalle St., Chicago, Ill.
Central Alloy Steel Corp., Massillon, O.
Elliott-Blair Steel Co., New Castle, Pa.
Griffin Mfg. Co., 15th and Cherry Sts., Erie, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Pittsburgh Cold Rolled Steel Co., Verona, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Superior Steel Corp., Union Trust Bldg., Pittsburgh, Pa.
Trumbull Steel Co., The, Warren, O.
Weirton Steel Co., Weirton, W. Va.
West Leechburg Steel Co., Farmers Bank Bldg., Pittsburgh, Pa.

STEEL (Structural)
Alliance Structural Co., The, Alliance, O.
American Bridge Co., 71 Broadway, New York City.
Belmont Iron Works, 22nd and Washington Ave., Philadelphia, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Bollinger-Andrews Construction Co., 1016 Empire Bldg., Pittsburgh, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Eichleay, John, Jr., Co., So. 20th and Wharton, Pittsburgh, Pa.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Kratzer, W. N., Co., 3212 Smallman St., Pittsburgh, Pa.
McClintic-Marshall Co., Oliver Bldg., Pittsburgh, Pa.
Ohio Structural Steel Co., The, Newton Falls, O.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Republic Iron & Steel Co., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown-Marx Bldg., Birmingham, Ala.

STEEL (Tool)
Bethlehem Steel Co., Bethlehem, Pa.
Bourne-Fuller Co., The, 1912 Scranton Rd., Cleveland, O.
Firth-Sterling Steel Co., McKeesport, Pa.
Kidd Drawn Steel Co., Aliquippa, Pa.
Latrobe Electric Steel Co., Latrobe, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Ryerson, Jos., T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Vanadium Alloys Steel Co., Latrobe, Pa.

STEEL (Swedish)
Brown-Wales Co., 493 C St., Boston, Mass.
Stahleker Steel Corp., 19 Congress St., Boston, Mass.

STEEL BUILDINGS—See BRIDGES, BUILDINGS AND VIADUCTS

STEEL (Carbon)
Bethlehem Steel Co., Bethlehem, Pa.

STEEL DOORS AND SHUTTERS
Kinnear Mfg. Co., 818-868 Field Ave., Columbus, O.

STEEL FABRICATORS—See BRIDGES, BUILDINGS AND VIADUCTS

STEEL PLATE CONSTRUCTION
Biggs Boiler Co., The, Akron, O.
Blaw-Knox Co., 602 Farmers Bank Bldg., Pittsburgh, Pa.
Blystone Mfg. Co., Ironton St., Cambridge Springs, Pa.
Hammond Iron Works, Warren, Pa.
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Steel Plate Products Co., Pottstown, Pa.

STEEL PLATES — See PLATES (Iron and Steel)

STEEL STAMPINGS—See STAMPINGS

STELLITE
Haynes Stellite Co., 30 E. 42nd St., New York City.

STEP HANGERS
Transue & Williams Steel Forging Corp., Alliance, O.

STEPS (Safety Stair, Car and Ladder)
Hendrick Mfg. Co., 43 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

STOKERS
Babcock & Wilcox Co., The, 85 Liberty St., New York City.
Combustion Engineering Corp., 200 Madison Ave., New York City.

STOOLS AND FACTORY EQUIPMENT (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

STRAIGHTENING MACHINERY
Shuster, The F. B., Co., New Haven, Conn.
Sutton Engineering Co., Park Bldg., Pittsburgh, Pa.

STRIP MILLS (Hot or Cold)
Treadwell Engineering Co., Easton, Pa.

STRIPSHEETS
American Rolling Mill Co., Middletown, O.

STRIP STEEL (Cold Rolled)
Morris & Bailey Division, Oliver Iron & Steel Corp., Oliver Bldg., Pittsburgh, Pa.

STRIP STEEL STRAIGHTENERS
Shuster, The F. B., Co., New Haven, Conn.

STRIP STEEL (Cold Rolled)
Morris & Bailey Division, Oliver Iron & Steel Corp., Oliver Bldg., Pittsburgh, Pa.

STRUCTURAL IRON AND STEEL WORK— See STEEL (Structural)

SULPHURIC ACID
Cleveland-Cliffs Iron Co., Union Trust Bldg., Cleveland, O.

SWITCH STANDS
Bethlehem Steel Co., Bethlehem, Pa.

SWITCHBOARDS
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

SWITCHES (Automatic Float, Magnetic, Remote Control, Synchroneus Motor Starters)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.

SWITCHES (Electric)
Electric Controller & Mfg. Co., The, 2698 E. 79th St., Cleveland, O.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

TANKS (Acetylene)
National Tube Co., Frick Bldg., Pittsburgh, Pa.

TANKS (Storage, Pressure, Riveted, Welded)
Air Tight Steel Tank Co., Mansion and Gloster Sts., Pittsburgh, Pa.
Biggs Boiler Co., The, Akron, O.
Hammond Iron Works, Warren, Pa.
Petroleum Iron Works Co., Sharon, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Sotter Bros., Inc., Pottstown, Pa.
Steel Plate Products Co., Pottstown, Pa.

TANKS (Wood or Steel, Lead Lined)
Dietzel Lead Burning Co., Keystone Bldg., Pittsburgh, Pa.

TAPPING MACHINES
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

TAPPING MACHINES (Friction Drive Type)
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TAPS (Collapsible)
National Acme Co., E. 131st St. & Coit Rd., Cleveland, O.
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TAPS AND DIES
Landis Machine Co., Waynesboro, Pa.

TERNE PLATE
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.

TESTING MACHINES
Riehle Bros. Testing Machine Co., 1424 N. 9th St., Philadelphia, Pa.

TESTING MACHINES (Pipe)
Taylor-Wilson Mfg. Co., McKees Rocks, Pa.

THERMO COUPLES
Taylor Instrument Co., 95 Ames St., Rochester, N. Y.

THREAD CUTTING TOOLS
Landis Machine Co., Waynesboro, Pa.

THREADING MACHINERY
Rickert-Shafer Co., Dept. T. M., Erie, Pa.

TIE PLATES
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.

TIES (Creosoted)
Century Wood Preserving Co., 1081 Century Bldg., Pittsburgh, Pa.

TILE (Cement Roofing)
American Cement Tile Mfg. Co., Oliver Bldg., Pittsburgh, Pa.

TIN PLATE
American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Granite City Steel Works, The, Granite City, Ill.
Mansfield Sheet & Tin Plate Co., Mansfield, O.
National Enameling & Stamping Co., Granite City, Ill.
Trumbull Steel Co., The, Warren, O.
Youngstown Sheet & Tin Plate Co., Stambaugh Bldg., Youngstown, O.
Weirton Steel Co., Weirton, W. Va.

TIN PLATE EQUIPMENT
Aetna-Standard Engineering Co., The, Youngstwon, O.

TITANIUM
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.

TOOL BITS (High Speed)
Firth-Sterling Steel Co., McKeesport, Pa.

TOOL BITS, (Stellite)
Haynes-Stellite Co., 30 E. 42nd St., New York City.

TOOLS (Pneumatic)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.
Cleveland Pneumatic Tool Co., 3734 E. 78th St., Cleveland, O.
Ingersoll-Rand Co., 11 Broadway, New York City.

TOOLS (Portable Electric)
Chicago Pneumatic Tool Co., 6 E. 44th St., New York City.

TORCHES AND BURNERS (Acetylene, Blow, Oxy-Acetylene)
Air Reduction Sales Co., 342 Madison Ave., New York City.
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

See Index to Advertisements for Pages Containing Advertisements of Companies Listed Above

LARGEST BUILDERS OF THE WORLD'S LARGEST CRANES

Alliance Products

STANDARD CRANES
Up to 430 tons capacity

STRIPPING CRANES
Up to 320 tons capacity

COMBINATION CHARGERS and STRIPPERS
Up to 200 tons capacity

Ladle Cranes
Ingot Strippers
Soaking Pit Cranes
Open Hearth Charging Machines
Slab and Billet Charging and Drawing Machines
Gantry Cranes
Ore and Coal Bridges
Car Dumpers
Forging Manipulators
Steam Drop Forged Hammers
Coke Pushers, Levelers and Door Lifters
Coal Pier Equipment
Rolling Mill Machinery
Cement Plant Machinery
Dock Handling Equipment
Coke Oven Equipment

228 of 100 Ton Capacity and over

LADLE AND STANDARD CRANES

58	100 tons
2	115 tons
44	125 tons
27	150 tons
3	160 tons
1	165 tons
28	175 tons
2	200 tons
1	225 tons
1	250 tons
1	275 tons
3	430 tons

STRIPPING CRANES

8	100 tons
1	125 tons
21	150 tons
15	200 tons
1	Single Ram, 320 tons

COMBINATION CHARGERS AND STRIPPERS

3	100 tons
1	125 tons
3	150 tons
4	200 tons

Give Us the Runway and We will Lift the World

THE ALLIANCE MACHINE CO.

ALLIANCE, OHIO, U.S.A.
ENGINEERS AND BUILDERS

Ohio LIFTING MAGNETS are indestructible

All insulation is Asbestos. They have maximum lifting capacity. Outer ring has no through holes; it does not loosen, wear out or break.

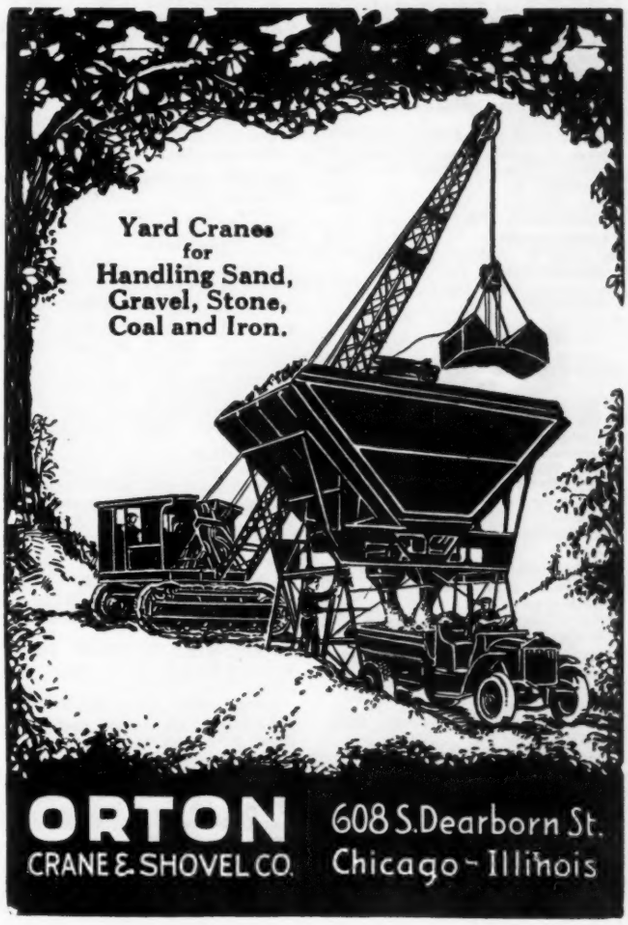
The Ohio Electric & Controller Co.
Cleveland, Ohio

Don't give up— *try a real digger*

If you haven't had a bucket that will dig your material or *stand up* in the work—
Get a Heavy Duty WILLIAMS "Hercules." This powerful bucket has dug materials that were previously rated "not practical as a bucket job." Write for our new Bucket Book.

G. H. WILLIAMS COMPANY
611 Haybarger Lane Erie, Pa.
Branch Offices:
New York, Pittsburgh, Cleveland, Chicago

WILLIAMS
FAST-DIGGING BUCKETS



ORTON
CRANE & SHOVEL CO.
608 S. Dearborn St.
Chicago - Illinois

TOTE BOXES
Wall, P., Mfg. Supply Co., Pittsburgh, Pa.

TOWERS (Transmission)
American Bridge Co., 71 Broadway, New York City.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.

TRAMRAILS
Cleveland Electric Tramrail, Division of the Cleveland Crane and Engineering Co., Wickliffe, O.
Harnischfeger Corp., 3811 National Ave., Milwaukee, Wis.

TREADS (Safety Stair and Ladder)
American Abrasive Metals Co., 50 Church St., New York City.
Hendrick Mfg. Co., 48 Dundaff St., Carbondale, Pa.
Irving Iron Works, Long Island City, N. Y.

TROLLEYS
Hanna Engineering Works, 1766 Elston Ave., Chicago, Ill.
Roeper Crane & Hoist Works, 1729 No. 10th St., Reading, Pa.
Shepard Electric Crane & Hoist Co., 358 Schuyler Ave., Montour Falls, N. Y.

TRUCKS (Motor)
Graham Bros. Division of Dodge Bros., Inc., Lynch Rd., Detroit, Mich.

TRUCKS (Welding)
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

TRUCKS AND TRACTORS (Electric Industrial)
Atlas Car & Mfg. Co., 1140 Ivanhoe Rd., Cleveland, O.

TUBE MILL MACHINERY
Aetna-Standard Engineering Co., The, Youngstown, O.
Mackintosh-Hemphill Co., 12th & Etna Sts., Pittsburgh, Pa.
Treadwell Engineering Co., Easton, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.

TUBES
Michigan Steel Tube Products Co., Holbrook and Buffalo Sts., Detroit, Mich.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill
Timken Roller Bearing Co., The, Canton, O.
Tyler Tube & Pipe Co. The, Washington, Pa.

TUBES (Boiler)
Babcock & Wilcox Tube Co., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Keating, E. F., Co., 446-54 Water St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill
Tyler Tube & Pipe Co., The, Washington, Pa.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBES (Charcoal Iron Boiler)
Bethlehem Steel Co., Bethlehem, Pa.
Tyler Tube & Pipe Co., The, Washington, Pa.

TUBES (Cold Drawn Seamless Steel)
Babcock & Wilcox Tube Co., Beaver Falls, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Pittsburgh Steel Products Co., Union Trust Bldg., Pittsburgh, Pa.
Summerill Tubing Co., Bridgeport, Pa.
Timken Roller Bearing Co., The, Canton, O.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBES (Lap-Welded Boiler)
Bethlehem Steel Co., Bethlehem, Pa.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Tyler Tube & Pipe Co., The, Washington, Pa.

TUBES (Seamless or Lap-Welded)
Keating, E. F., Co., 446-54 Water St., New York City.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.

TUBES (Welded Steel)
Michigan Steel Tube Products Co., Holbrook and Buffalo Sts., Detroit, Mich.

TURBINES (Steam)
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General Electric Co., Schenectady, N. Y.

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Republic Iron & Steel Co., Youngstown, Ohio

TURNTABLES
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TUYERES
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TWIST DRILLS—See DRILLS

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Jenkins Brothers, 80 White St., New York City.

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Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
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Union Drawn Steel Co., Beaver Falls, Pa.

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Oliver Iron & Steel Corp., So. 10th and Muriel Sts., Pittsburgh, Pa.

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Williams & Co., Inc., 915-937 Pennsylvania Ave., Pittsburgh, Pa.
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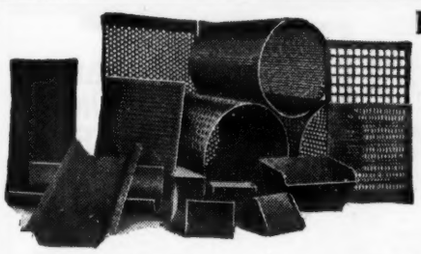

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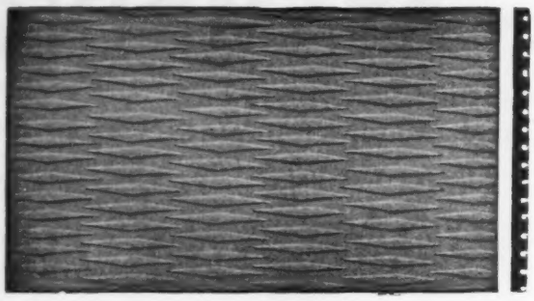

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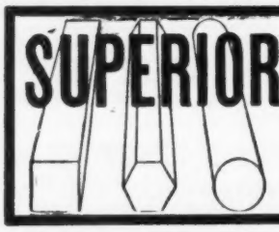

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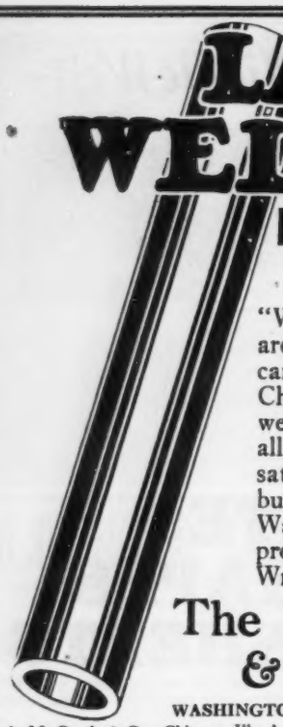

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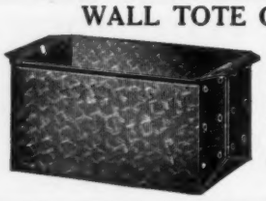

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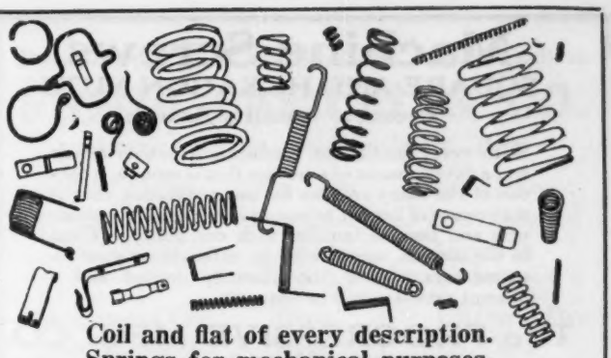

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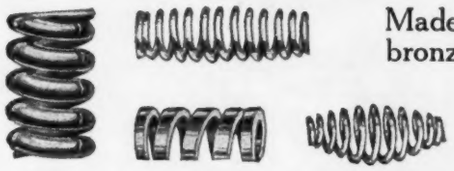

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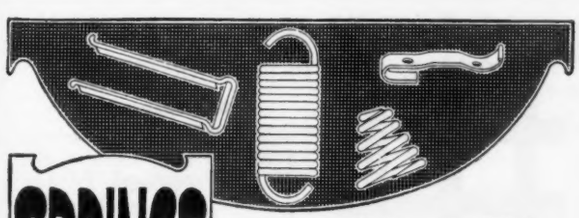

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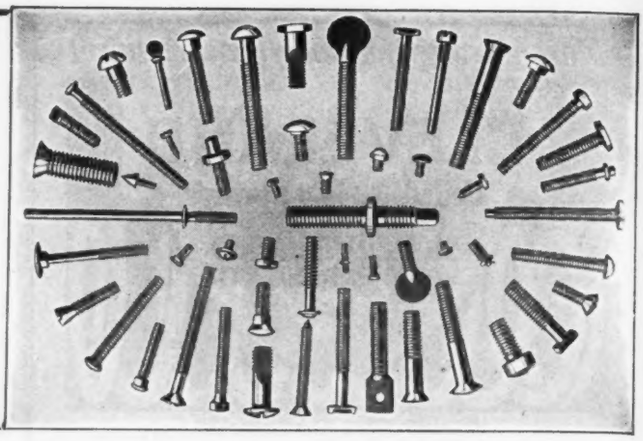

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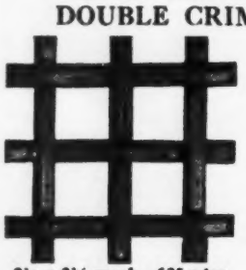

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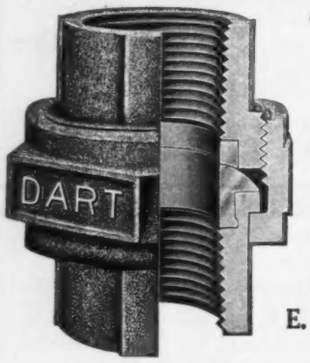

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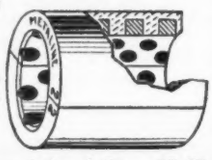

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4" Bignall & Keeler Pipe Machine.

BRAND NEW

36" Single End Punch & Shear, architectural jaw. Punch 1" x 1", shear ⅞" plate, 1½" squares, 1¾" rounds, 6" x 1" flats and 3½" x 3½" x ½" angles. Has punching and plate shearing attachments.

Was $1650.00
Now $1100.00 Net

Wickes Machinery Co.
425 Claremont Ave., Jersey City, N. J.

RAILS AND TRACK EQUIPMENT
Rails—all sections—New and Relaying. Also Frogs and Switches, Bridge Girders, I-Beams, Portable Track. Old and New Mine and Industrial Cars of various gauges in stock for immediate shipment.
M. K. FRANK
Park Row Bldg. New York, N. Y. Union Trust Bldg. Pittsburgh, Pa.

STEEL SHEET PILING
Rented—Sold—Bought
Pile Hammers Rented
WEMLINGER, INC.
149 Broadway, New York

DISMANTLERS of BLAST FURNACES
Also other plants
15 years experience
HENRY POTTS & CO.
Bankers Trust Bldg. Philadelphia, Pa.

"We still have it."

During a conversation with one of our subscribers we were told that he had discontinued one phase of his business. We asked this party what he had done with the machine used in this department and he replied, "We still have it."

He has now decided to turn this idle equipment into cash through a classified advertisement in Iron Trade Review—*can we serve you?*

Employment

POSITIONS OFFERED
Minimum ad., 50 words, $3.00
Additional words, $.06 each

When a box address is desired count seven words in addition to your copy

POSITIONS WANTED
Minimum ad., 30 words, $1.00
Additional words, $.03

Help Wanted

PRODUCTION MANUFACTURING EXECUTIVE:—We have an opening for the best production man in this country, to take charge of an entire plant, manufacturing automobile parts. He must be able to install the most modern machinery. None but the most experienced men with a record of definite performance will be considered. Address Box 232, IRON TRADE REVIEW, Cleveland.

IF YOU ARE OPEN TO OVERTURES for new connection, and qualified for a salary between $2500 and $25,000, your response to this announcement is invited. The undersigned provides a thoroughly organized service, of recognized standing and reputation, through which preliminaries are negotiated confidentially for position of the calibre indicated. The procedure is individualized to each client's personal requirements; your identity covered and present position protected. Established seventeen years. Send only name and address for details. R. W. Bixby, Inc., 110 Downtown Building, Buffalo, New York.

GENERAL MANAGER AND SALES MANAGER to assume complete responsibility selling Swedish Billets, Rods and Drill Steels. Address Box 234, IRON TRADE REVIEW, Cleveland.

Help Wanted

ENGINEERING POSITIONS—SPECIALIZING in placement of Executives, Sales Managers, Sales Engineers, Production Engineers, Designers, Draftsmen, Tracers and Technical men for various office, plant and Field engineering positions; also Architects, Purchasing Agents, Teachers, Chemists and Employment Managers. If qualified and experienced, please call or write for blank. Cleveland Engineering Agency, 904 Rose Bldg., Cleveland, Ohio.

$3000-$30,000 MEN FIND OUR SERVICE effective in making connections. Individual. Confidential. Personally planned by Jacob Penn. All metalworking and machinery business men know him, believe in him. Not agency. Jacob Penn, Incorporated, 9 Park Place, New York.

Positions Wanted

CHEMIST, GRADUATE, WIDE EXPERIENCE in various industrial lines including ten years in blast furnace work. Desire new connection with steel or iron plant. Address Box 236, IRON TRADE REVIEW, Cleveland.

Positions Wanted

A SUCCESSFUL SALES EXECUTIVE IS available. For several years he has been sales manager of a large manufacturing company nationally known in its line. Results have been unusual. These as well as his moral standing will stand rigid investigation. He has a thorough knowledge of sales promotion methods. References of the very highest type. In the prime of life. A modern, progressive and seasoned executive. His record cannot fail to convince you. Address Box 237, IRON TRADE REVIEW, Cleveland.

PURCHASING AGENT

Man age 33 desires new connection as Purchasing Agent, Superintendent of General Stores or Buyer. 10 years Automotive and Electrical experience. All types of castings, steel, lumber, oil, factory and mill supplies. Write or wire G. W. Quickle, 6650 Newgard, Chicago, Ill. Phone Rogers Park 8186, evenings. Will locate anywhere.

STEEL FOUNDRY SUPERINTENDENT qualified to take complete charge of plant from furnaces to shipping room. Have ability and experience needed. Address Box 238, IRON TRADE REVIEW, Cleveland.

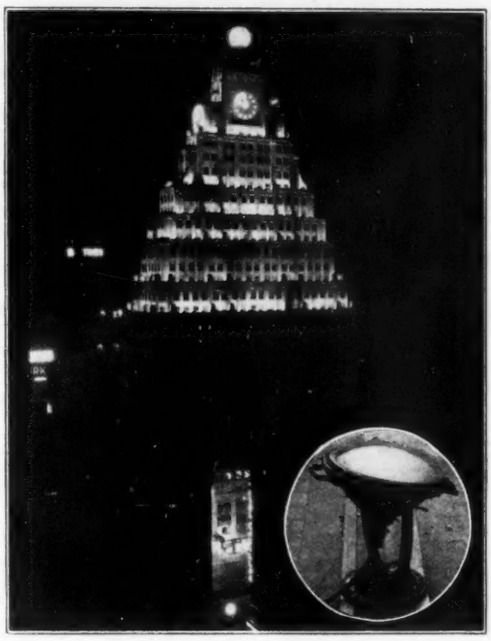
"Is this the Classified Department?

Just wanted to call and tell you that the results obtained from my Position Wanted advertisement were very good. I received four replies—two of these were very good positions."

This call was received recently from a Cleveland man. If you need a man or desire a position try Iron Trade Review . . . . . *can we serve you?*

Opportunities

Advertisements in this section are referred to by those seeking plants and plant sites, miscellaneous semi-finished and finished raw materials; by those who desire agencies.
Advertising Rates: 1" One Time $5.00; 2" One Time $9.50; 3" One Time $14.00; 4" One Time $18.00



Drawing Power

THE Paramount Building in New York is one of the new buildings commanding the attention of thousands nightly by using floodlights to stress the set back features of the building.

Just as great as this power which turns the eyes of these people skyward is the drawing power of the Classified Section of Iron Trade Review. It attracts the attention of our readers who are prospective buyers of the plant or equipment which you wish to sell. . . . . *can we serve you?*

BLAW-KNOX WANTS GRATING DISTRIBUTOR

Are you the man or the firm who can make a success of selling Blaw-Knox Security Steel Grating and Open Flooring in your locality? This grating has five points of primary advantage over others in the market and is extremely easy to sell as its advantages are immediately apparent.
It is extra strong, electroforged in one piece, has positive nonslip features, gives maximum lighting and ventilation and can be 100% effectively galvanized or painted.
This new grating is causing a sensation among buyers. The Blaw-Knox, well known manufacturers of steel specialties, have a few good territories open for distributors who are in a position to sell engineers, architects, contractors, industrial plants etc. Preliminary correspondence is invited. Tell us what lines you now handle, the extent of your organization, and the territory you cover. Blaw-Knox Company, Pittsburgh, Pa.

CONSULT US FOR
F A C T O R I E S
IN THE CENTRAL STATES
Excellent locations with low labor costs. Foundries, Machine Shops and Plants with or without equipment for sale or lease. Free industrial sites to responsible manufacturers, with buildings erected and financed. Write us your requirements.
FANTUS FACTORY LOCATING SERVICE
1323 South Oakley Ave., Chicago

Write For Our List.
"METAL MFG. & IRON BUSINESS"
For Sale.
FEDERAL BROKERS, INC.
A. I. U. Bldg. Columbus, Ohio

SPECIALISTS IN
FACTORIES
FOR SALE OR LEASE
Have professional engineers with extensive plant experience who can therefore appreciate your requirements, aid you in locating a suitable factory or manufacturing industry.
TECHNICAL SERVICE COMPANY
233 Broadway, N. Y. C. Whitehall 8412

MANUFACTURERS NOTICE

Old-established jobbing steel warehouse in Philadelphia with active sales organization and traveling ten salesmen thru tributary territory and handling varied line of iron and steel products, desires direct connection with manufacturers of spikes, nails, bolts, nuts, washers, etc. Would also be interested in any lines or specialties they are not now selling. Have highest capital and credit rating. All replies confidential.

Address Box 228,
IRON TRADE REVIEW, Cleveland

Fill-in and Contract Work

CASTINGS — FORGINGS — STAMPINGS — PATTERNS
MACHINE PRODUCTS — DIES, JIGS, FIXTURES and TOOLS

HOT DIP GALVANIZING

We have the largest hot dip job galvanizing plant and kettles in the United States.

We have the most modern equipment to do first class galvanizing at lowest prices. Galvanizing Products Furnished.

Prime Western Zinc used exclusively.

Send us your inquiries

Joseph P. Cattie & Brothers
Gaul and Letterly Streets
PHILADELPHIA

MACHINE WORK

Structural Steel Work
Patterns — Castings

We have excess capacity available and solicit your inquiries. Our broad engineering experience and modern shop facilities are both at your disposal. Send us your inquiries and blue prints for prices and prompt service.

The WELLMAN-SEAVER-MORGAN-CO.
Cleveland, Ohio

Machine Work

Machine shop equipped for a general line of first class work, has surplus capacity, and is in position to figure on contracts or general jobbing. Address

R. S. HISLOP, Supt.
1620 Racine St. Racine, Wis.

Buyers follow

classified advertising

Make a chart of your business —

Have you ever made a chart of your business over a period of a year? Does it have a tendency to fluctuate showing peaks of prosperity and then periods of depression?

These fluctuations are one of the greatest competitors your business must face. If you have a condition of this type to contend with why not try a remedy — Fill-in and Contract Work Advertising, it will place your business on a more stable basis.

CASTINGS

CONNECTICUT

THE SESSIONS FOUNDRY CO., INC., Bristol. Gray iron from smallest to thirty tons. Pattern and machine shop.

DELAWARE

DEEMER STEEL CASTINGS CO., Washington Boulevard, New Castle. Small and medium size steel castings.

ILLINOIS

A. PLAMONDON MFG. CO., Chicago, 5301 South Western Blvd. Gray iron castings. Machine and Pattern shop.

WANNER MALLEABLE CASTINGS CO., Quality Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

INDIANA

HUBBARD STEEL FOUNDRY CO., East Chicago. Steel castings up to 100,000 lbs. sand iron and chilled iron rolls.

MARION MACHINE, FOUNDRY & SUPPLY CO., Marion. Gray iron, semi-steel up to 20,000 lbs. Building specialties; pattern and machine work.

RELIANCE FOUNDRY CO., Richmond. High quality gray iron and semi-steel castings, one to five tons. Let us quote you prices.

WANNER MALLEABLE CASTINGS CO., Quality Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

IOWA

CENTRAL FOUNDRY CO., Marshalltown. Light and medium gray iron. Pistons and auto acces. B & B Sanitary Heated Stock Fountains.

DAVENPORT MACHINE & FOUNDRY CO., Davenport. Heavy gray iron and semi-steel to ten tons. Mfgrs. of "Davenport" Molding Machines.

MICHIGAN

AUTO SPECIALTIES MFG. CO., St. Joseph. Highest grade malleable castings, either plain or machined, and finished to blue print.

ENTERPRISE BRASS WORKS, Muskegon. Bronze and aluminum castings. Plumbers brass goods.

LAKE SHORE ENGINE WORKS, Marquette. Gray iron castings up to fifteen tons. Pattern shop and machine shop.

CASTINGS

NEW JERSEY

WEST BERGEN IRON FOUNDRY, Jersey City, 21-27 Pollock Ave. Soft gray iron casting up to 5 tons each.

NEW YORK

AMERICAN ABRASIVE METALS CO., 50 Church St., N. Y. C. Foundry, Irvington, New Jersey. Iron, bronze and aluminum flat castings in quantities.

BUFFALO FOUNDRY & MACHINE CO., Buffalo. Gray iron, semi-steel and special mixture castings, 1 to 200 tons. Pattern and machine shop.

FARRAR & TREFTS, INC., Buffalo, 67 Perry St. Gray iron, 1 lb. to 50 tons. Semi-steel, chemical and chilled castings. Manholes and grates.

FRONTIER BRONZE CORP., Niagara Falls. Titanium, aluminum, bronze, copper, aluminum, brass castings. Bronze bushings in stock.

METAL & ALLOY SPECIALTIES CO., INC., Buffalo. Brass, bronze, aluminum, monel metal. Copper, nickel bronze. Pattern, mach. shop.

SHERWOOD MFG. CO., Buffalo, 1701 Elmwood Ave. Brass and bronze castings to your specifications. Complete machining facilities.

OHIO

THE AMERICAN CRUCIBLE PRODUCTS CO., Lorain. Brass, bronze and aluminum castings. Machined parts. Mill brasses a specialty.

THE CINCINNATI STEEL CASTINGS CO., Cincinnati. Queen City and Spring Grove Aves. Electric process steel castings only.

THE COMMERCIAL STEEL CASTINGS CO., Marion. Acid open hearth steel castings 5 lbs. to 10 tons. Shipping facilities on five railroads.

CRUCIBLE STEEL CASTING CO., Cleveland. Electric steel castings. Specialize in nickel-chrome alloys for abrasive wear and high ultimates.

THE EBERHARD MFG. CO., Cleveland, 2734 Tennyson Rd. Light malleable iron castings for automobile and general purposes.

THE MACHINED STEEL CASTING CO., Alliance. Acid open hearth steel castings, 1 lb. to 100,000 lbs. each. Castings machined if desired.

QUAKER CITY FOUNDRY, INC., Salem. Light and Medium weight Gray Iron or Semi-steel. Machine or hand molded, tumbled or sand blasted.

THE WEST STEEL CASTING CO., Cleveland. High grade light work steel castings, 1 to 500 lbs. Quality work desired. Qual. and service guaranteed.

PENNSYLVANIA

AMERICAN ENGINEERING CO., Philadelphia. Aramingo & Cumberland Sts. Gray iron and semi-steel from 1 to 24,000 lbs. Long and varied experience.

DAVIES & THOMAS CO., Catasauqua, (N. Y. Office, 342 Madison Ave.) Gray iron up to 10,000 lbs. Complete machine and pattern shops.

FORT PITT STEEL CASTING CO., McKeesport. Specializing in accurate, uniform electric steel castings of every description.

GRAY IRON FOUNDRY CO., Reading. Specializing on small castings of every description. Machining or hand molded, tumbled or sand blasted.

JOHNSON BRONZE CO., New Castle. Brass and bronze castings, both machined and finished. From ¼ lb. to 100 lbs. finished; ½ to 1000 lbs. rough.

CASTINGS

PENNSYLVANIA

MARION MACHINE, FOUNDRY & SUPPLY CO., Scottdale. Gray iron, semi-steel, up to 20,000 lbs. Building specialties; pattern, machine work.

MEADVILLE MALLEABLE IRON CO., Meadville. High grade malleable castings from refined air furnace iron. Pattern and machine shop.

NATIONAL FOUNDRY CO., Erie. Steel castings of all descriptions. Patterns and machine shop in connection.

NAZARETH FOUNDRY & MACHINE CO., Nazareth (Eastern Penna.) Gray iron castings, brass castings. Complete machine and pattern shops.

NORTH WALES MACHINE CO., INC., North Wales. Gray iron, superior quality machine or hand molded, sand blasted, pickled or tumbled.

READING STEEL CASTING CO., Reading. Electric and open hearth steel castings, 1 lb. to 20 tons.

TAYLOR-WILSON MANUFACTURING CO., McKees Rocks. Gray iron to 10 tons. Semi-steel. Machine molded gears. Machine and pattern shops.

TREADWELL ENGINEERING CO., Easton. Iron castings to 35 tons. Electric steel castings to 5,000 lbs. Complete machining facilities.

UNION SPRING & MANUFACTURING CO., New Kensington. Electric steel castings. Manganese steel castings a specialty. Alloy castings.

RHODE ISLAND

UNIVERSAL WINDING CO., Providence, 1655 Elmwood Ave. Soft gray iron; free machining; quan. production; charcoal mixture, up to 6,000 lbs.

WISCONSIN

WANNER MALLEABLE CASTINGS CO., Quality Malleable Castings. Carefully finished. Pattern Shop. Works, Hammond, Ind.; Beloit, Wis.

PATTERNS

OHIO

STANDARD PATTERN WORKS CO., Cleveland. Machine cut wood and metal gear patterns. Matchplates. Moulding machine equipment.

MACHINE PRODUCTS

MISSOURI

CRAGO GEAR AND MACHINE WORKS, Kansas City. Spur gears from one inch to six feet. Worms, sprockets and specials. Machine work.

FORGINGS

CONNECTICUT

COLT'S PATENT FIRE ARMS MFG. CO., Hartford. Modern equipment, long experience in drop forging. Fine machine finishing. At your service.

INDIANA

BASS FOUNDRY & MACHINE CO., Fort Wayne. Double refined hammered iron for draw bars and other severe usage. Hammered steel forgings.

OHIO

AMERICAN FORGE & MACHINE CO., Canton. Drop and drawn forgings. Machining and heat treating. Hot dip galvanizing.

OHIO FORGE CO., Cleveland. Drop forgings and general forgings. Capacity 800 to 6,000 lbs. Weldless rings, shafting.

STAMPINGS

CONNECTICUT

THE AMERICAN TUBE & STAMPING PLANT The Stanley Works, Bridgeport. Stampings, forming and assembling. Modern methods and equipment.

THE KIRBY MFG. CO., Middletown. For your small metal stampings, why not come to Kirby specialists. Blanking, forming, assembling.

THE ROOT CO., Bristol. Light and medium quality stampings from steel, brass or copper. Get our quotation.

THE STANLEY WORKS, New Britain. Special Productions Department. Stanley stampings excel in quality.

ILLINOIS

JOLIET WROUGHT WASHER CO., Joliet. Standard washers and riveting burrs. Special washers. Steel stampings.

MASSACHUSETTS

LARSON TOOL & STAMPING CO., Attleboro, 501 Olive St. Medium and light stampings, all metals, complete assemblies. Single pieces or carloads.

MICHIGAN

LANSING STAMPING CO., Lansing. Heavy medium and light metal stampings. Send blue prints or samples for estimate.

PENNSYLVANIA

CENTRAL IRON & STEEL CO., Harrisburg. Steel stampings and pressed metal parts. ¼" and heavier. Unusual facilities. Send your specifications.

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STANDARD SPECIFICATIONS FOR OIL STORAGE TANKS

TABLE 200

Code Word	Nominal Capacity in Barrels (42 U.S. Gallons)	Size		Nominal Capacity U.S. Gallons	Thickness of Plates								Bottom Angle	Top Angle	Estimated Weight
		Diam.	Height		Ring 1	Ring 2	Ring 3	Ring 4	Ring 5	Ring 6	Bottom Sketch	Bottom Rect.			
WUVNE	300	15′	10′	13431	$\frac{3}{16}$"	$\frac{1}{16}$"	—	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	2½"x2½"x¼"	2½"x2½"x¼"	
WUVSY	450	15′	15′	20115	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUVUR	500	20′	10′	24089	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUVYS	750	20′	15′	35538	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYAP	1000	20′	20′	47514	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYGD	850	25′	10′	37600	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	2½"x2½"x$\frac{3}{16}$"	"	
WUYIR	1300	25′	15′	55900	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYLJ	1700	25′	20′	74310	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYMK	2000	25′	25′	92686	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYOS	1250	30′	10′	54148	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYPA	1800	30′	15′	80607	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	—	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYSO	2500	30′	20′	106635	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	—	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYUT	3000	30′	25′	133017	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUYVY	3700	30′	30′	159952	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUZER	4000	35′	25′	181706	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	—	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUZRE	5000	35′	30′	217657	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WUZTO	5600	40′	25′	237307	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	—	$\frac{1}{4}$"	$\frac{3}{16}$"	3"x3"x$\frac{3}{16}$"	"	
WUZUV	6700	40′	30′	284289	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WYAXY	8500	45′	30′	359811	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WYBAB	10000	50′	30′	444152	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	2½"x2½"x$\frac{3}{16}$"	
WYBBA	12000	50′	35′	517510	$\frac{3}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WYBCE	15000	60′	30′	639750	$\frac{3}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	3"x3"x$\frac{3}{16}$"	
WYBEC	20000	70′	30′	870750	$\frac{3}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	4"x4"x$\frac{3}{16}$"	"	
WYBFO	25000	80′	30′	1137336	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WYBID	34000	90′	30′	1439470	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	
WYBOF	55000	115′	30′	2349500	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{1}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{1}{4}$"	$\frac{3}{16}$"	4"x4"x$\frac{3}{16}$"	3"x3"x$\frac{3}{16}$"	
WYBUG	80000	120′	40′	3404300	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"	$\frac{3}{16}$"†	$\frac{1}{4}$"	$\frac{3}{16}$"	"	"	

Ring 7—$\frac{3}{16}$". † Ring 7—¼"; Ring 8—$\frac{3}{16}$".

Tanks as listed are furnished with $\frac{1}{16}$"or No.10 Gauge Roofs. Each Tank equipped with one 20" Diameter Bolted Cover Manhole in Shell; one 20" Diameter Hinged Cover Manhole, Gas Tight, in Roof; Inlet and Outlet Flanges. Drawings of each size giving complete specifications will be furnished on application. Code Word refers to Tank with $\frac{1}{16}$" Roof. For tank with No. 10 Roof add Code Word—WYRIT—to Code Word given above.

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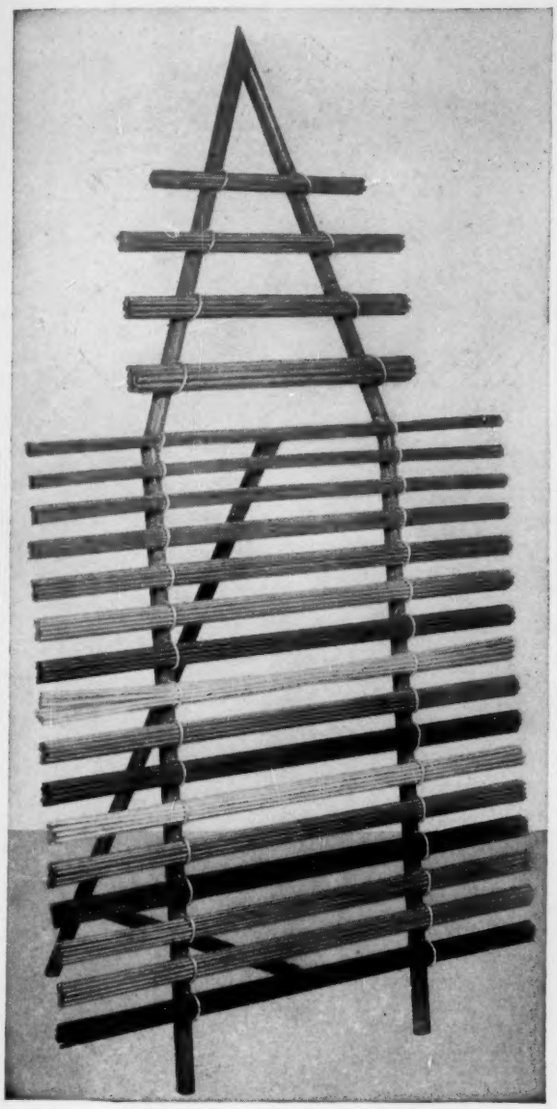

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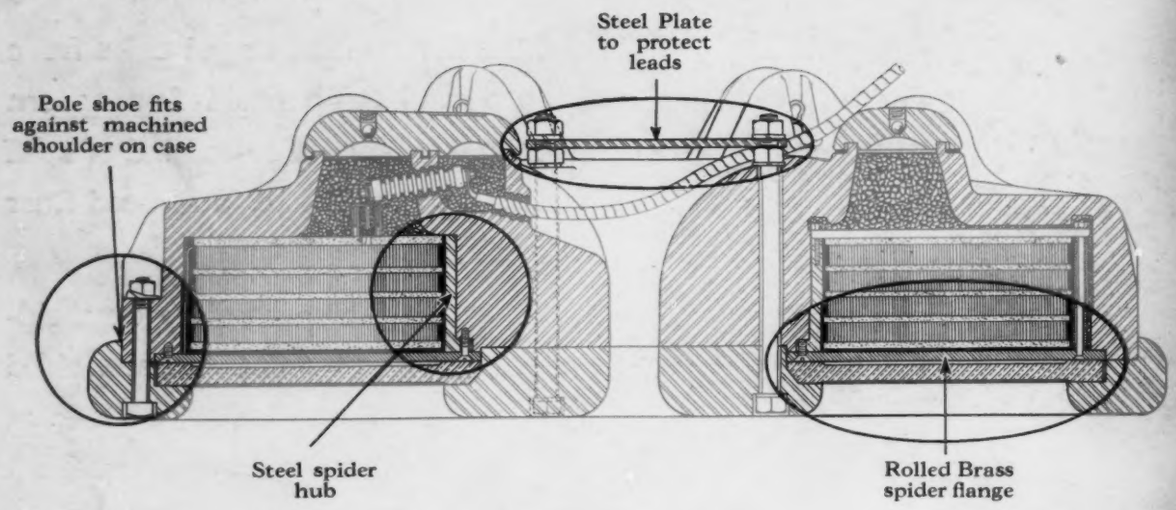
Steel Plate to protect leads
Pole shoe fits against machined shoulder on case
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Rolled Brass spider flange

The bottom flange of the coil spider is of heavy rolled brass plate, bolted to a cast steel hub. This non-breakable spider gives ample support to the increased weight of copper used in the new type SA Magnets.

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